Popular Music and Instrument Technology in an Electronic Age, 1960-1969

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Abstract

This dissertation is a study of musical instruments in 1960s popular music organized around the theme of electrification. New electrical technologies for tone production, timbral modulation, and amplification prompted radical shifts in the instrumentation used in the popular music of this period, leading musicians to borrow instruments from other cultures, such as the harpsichord and sitar, and to engage novel technologies, including synthesizers and effect pedals. Nonetheless, electricity became a ubiquitous feature of popular music rather late relative to other domains, such as domestic appliances and transportation. The adoption of electrification, like any new technology, is based on a balance of both technical considerations and social contexts. Why did electricity come to feature prominently in the production of popular music when it did and in the ways that it did? My principal objective with this project, then, is to account for the various socio-cultural agents responsible for the eventual widespread availability of electrical instrument technologies (including instrument designers, manufacturers, and retailers), the diverse sounds arising from their use in the hands of amateur and professional musicians, as well as the myriad meanings ascribed to them by musicians, critics, and fans alike. In order to account for the sounds, techniques, and gestures that emerged as a result of this process of electrification, I develop an interdisciplinary musicological perspective informed by studies of technology and genre.

Résumé

Cette thèse est une étude des instruments de musique employés dans la musique populaire des années soixante organisée autour du sujet de l'électrification. Les nouvelles technologies électriques pour la production du son, la modulation de la sonorité, et l'amplification ont poussé les musiciens à changer radicalement leurs outils ; en particulier, ils ont adopté des instruments d'autres cultures, comme le clavecin et le sitar, et des instruments novateurs, comme les pédales et le synthétiseur. Néanmoins, l'électricité est devenue tardivement une caractéristique omniprésente dans la musique populaire relativement à d'autres domaines, comme ceux des appareils domestiques et de la transportation. L'adoption d'électrification, comme toutes les nouvelles technologies, est fondée sur l'équilibre entre des considérations techniques et des contextes sociaux. Pourquoi l'électricité est-elle devenue une caractéristique proéminente dans la production de la musique populaire à ce moment et de cette façon ? Mon objectif principal, donc, avec ce projet, est d'expliquer les agents socioculturels différents qui sont responsables pour l'éventuelle disponibilité répandue des technologies électriques des instruments (incluant les designers, les fabricants, et les détaillants), les sons divers produits par les musiciens professionnels et amateurs, ainsi que la myriade des sens assignés à ces appareils tout comme par les critiques, les supporteurs, et les musiciens. Pour expliquer les sons, les techniques, et les gestes qui ont émergé en conséquence de ce processus d'électrification, je développe une perspective musicologique interdisciplinaire informée par les études de la technologie et du genre.

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Introduction | Popular Music and Instrument Technology in an Electronic Age

0.1: Project Overview

"This week's Music Show marks the arrival of the fully amplified musical age."[1]

On July 1, 1967, *Billboard* magazine published a "convention special" on the simultaneous occurrence of annual trade shows for both the National Association of Music Merchants (NAMM) and the Electronics Industry Association (EIA). While the EIA, in New York City, was abuzz with excitement about the new RCA Super 8 cartridge technology that was taking recorded music into mobile locations such as automobiles for the first time, NAMM, in Chicago, was taking part in an unprecedented coming-together of musical instruments from diverse historical periods and geographical locales. Between the 25th and 28th of June, guitars, harpsichords, zithers, and sitars could all be found mingling at the Chicago Music Show. As the epigraph above attests, the impetus driving these remarkable encounters was amplification.

Sound amplification was certainly not new in 1967. What was new, however, was the degree to which amplification and, by extension, the electrification of sound had become simultaneously both a ubiquitous and a marked feature of contemporary popular music, putting instruments of all shapes, sizes, origins, and, most importantly, levels of volume on an even footing both on stage and in the recording studio. Beginning with the guitar and spreading next

[1] "Tomorrow's Sounds Are Today's Sales," *Billboard,* July 1, 1967, WS51.

to the combo organ and beyond, by 1967 instrument manufacturers had fully grasped the potential of amplification to reshape the *Instrumentarium* of popular music—and, thus, the instruments that consumers of all ages desired to play—as its stars searched for novel, record-selling sounds.[2] Throughout that year, magazines like *Billboard* and *Variety* frequently speculated about the potential salability of myriad instruments being heard on popular recordings for the first time including recorders (The Association), kazoos (Spanky and Our Gang), bouzoukis (The Yardbirds), and more. "Lady Jane," a modest hit from The Rolling Stone's *Aftermath* (1966) that included a part for an amplified dulcimer played by Brian Jones, was an oft-cited example throughout '67 of the role that pop musicians and their success on the charts played in creating interest in unusual instruments.[3] Thus, what was taking place at NAMM was, by and large, a reflection of what was taking place in popular music as a whole; beginning in 1954, the American musical instrument industry would experience twelve years of continuous growth and, by the mid-1960s, manufacturers and retailers of musical instruments came to view recording artists as *the* deciding factor in predicting future sales.[4]

Recognizing music retailers' heightened interest in instruments, *Billboard* began to include a "Musical Instruments" section in nearly every issue of the magazine published between

[2] The term "instrumentarium" typically refers to a group of medical instruments used either by a particular specialist or for a particular procedure. In German, the term is also used to refer to a limited subsection of musical instruments, often specified chronologically (e.g., the instrumentarium of the eighteenth century) or generically (e.g., the jazz instrumentarium). It is in the latter sense that I employ the term throughout, although I will not observe the German capitalization of nouns beyond this first instance.

[3] See, for example, "Audio retailing: Rock Groups Lead Search for New Instrument Sounds," *Billboard*, June 24, 1967, 59-60 and Jerianne Roginski, "Dulcimers—Who Sells Them," *Billboard*, August 26, 1967, 16. *Aftermath* also included the chart-topping "Paint It Black," which featured Jones playing another "unusual" instrument: the sitar. Sitars constituted one of the most popular instrumental fads of the mid-to-late 1960s, resulting not only in the increased importation and sale of sitars, themselves, but also in the production of hybrid instruments such as the electric Rajah Zeetar and the Danelectro Coral Sitar. Despite Jones' usage of the instrument, George Harrison and Ravi Shankar largely eclipsed Jones with regard to the attention paid to their sitar playing in the pages of *Billboard*. I discuss these instruments in greater detail in chapter two.

[4] See, for example, "Record Retailing Today: Retail Disk Sales Hit New Mark," *Billboard*, October 16, 1956, 33 and "Tomorrow's Sounds are Today's Sales," *Billboard*, July 1, 1967, WS51.

July 8, 1967 (the week immediately following their supplemental "convention special") and March 21, 1970. The inclusion of this specialized feature attests to a profound shift in the role, place, and meaning of musical instruments within the whole of Anglo-American popular culture at the close of the decade. Indeed, the pride of place enjoyed by musical instruments at the end of the 1960s was partly the result of the huge growth in the number of people playing, learning, and buying instruments in lieu of other activities. In 1966, for example, *Billboard* reported that the sale of musical instruments had exceeded the sale of recorded music in dollar volume for the first time, in addition to "the combined dollar volumes of all spectator sports, still and movie cameras, comic books and playing cards," as well as the entire hobby industry.[5] Newly positioned at the center of popular culture, the diverse meanings associated with musical instruments largely came from without, trickling down from the status accorded to them by the increased breadth of their visibility and audibility in concerts, on recordings, on television programs, in the news, in advertisements, and so on. Time and time again throughout the 1960s, musical instrument retailers found that if a popular musician played a certain instrument, then fans would be incited to play (and therefore own) the same. Thus, like many kinds of twentieth-century consumer goods, musical instruments exuded what Jean Baudrillard has termed "sign-value," a worth in excess of an object's use- or exchange-value that is based on its prestigious social status.[6]

Many of the most important goods covered in *Billboard*'s "Musical Instruments" section were those that pertained to sound amplification, including amplifiers, microphones, and pickups. Industry personnel recognized that amplified sound was becoming an increasingly prevalent sonic feature of popular music and, correspondingly, that electrical instruments and

[5] "The Switched-On-Market, How to Turn Up Your Volume," *Billboard,* July 1, 1967, WS47.
[6] See Jean Baudrillard, *The Consumer Society: Myths and Structures* (London; Thousand Oaks; New Delhi: Sage Publications, 1998), especially part two, "The Theory of Consumption," 49-98.

amplifiers were taking up an increasingly large portion of instrument sales.[7] In 1967 these devices constituted a novelty and functioned as a signifier of modernity. By 1970, however, when the "Musical Instruments" section disappeared from the pages of *Billboard*, technologies of sound amplification had become so thoroughly incorporated into the paradigms of popular music production that they ceased to be noticed. Writing in 2001, after a new wave of digital music technologies had once again changed the paradigms of popular music making, Paul Théberge identified electrical amplification, along with microphones and loudspeakers, as a "fundamental" technology of popular music and measured its importance according to its (in)visibility, using the idea of "naturalization" to refer to the degree to which we cease being aware of its effects.[8] While it is difficult to imagine the production of popular music without these technologies today, their impact on this field was only just coming into focus in the mid-1960s, shortly after which they could be taken for granted. As Timothy Taylor has written:

> One of the ways technology works in Western culture is to call attention to itself when new, for at that moment it has no social life. It is true, of course, that it was produced as the result of a complex series of interconnected social processes, but at its moment of development… distribution and use, it has no social history. After a period of use, most technological artifacts are normalized into everyday life and no longer seen as "technological" at all, while whatever is new becomes viewed as "technological."[9]

[7] Recognizing the potential market force of amplified instruments, *Billboard* launched a series of articles on them intended for instrument dealers in early 1967. See "Kay Musical Instrum't Co. in Frets Since '90," *Billboard*, January 7, 1967, 47-48.
[8] Paul Théberge, "'Plugged in': technology and popular music," in *The Cambridge Companion to Pop and Rock*, ed. Simon Frith, Will Straw, and John Street (Cambridge: Cambridge University Press, 2001), 4.
[9] Timothy Taylor, *Strange Sounds: Music, Technology & Culture* (New York: Routledge, 2001), 6.

While nascent technologies may not have "social lives" as such, they are not, as Taylor points out, developed in a vacuum. Indeed, they are designed and produced with the intent of serving a specific function for which they are correspondingly marketed. While patterns of usage may not follow what was originally intended or anticipated, I would argue that new technologies are always pre-socialized. Thus, rather than speak of the emergence of a given technology's social life through use—implying that the social is absent prior to this—we might speak of the "stages" of its social life as it moves from design, development, early usage and, finally, normalization, when its function and meaning have stabilized. Taylor's crucial insight here is in pointing to the "technological" as a historically, geographically, and socially dependent quality of objects that influences how we perceive, value, and interact with them. As socialized objects "age" their apparent belonging to the category of technology becomes gradually obscured. The period of time roughly traced by *Billboard*'s "Musical Instruments" section, then, delimits a crucial moment in the history of popular music as amplification's "social life" transitions from early usage to normalization.[10] Paradoxically, although the technology involved in sound amplification was already more than sixty years old in 1967, and although it had been used in live performance for approximately half of that time, this technology came to powerfully signify novelty in popular music of the mid-1960s.[11] As amplification shifted from ubiquity to invisibility, it brought instruments from all eras and locales together for a brief moment as

[10] Instrument amplifiers were in use for many years before being thoroughly integrated into the production practices of popular music. Acoustic and lap steel Hawaiian guitars were some of the earliest beneficiaries of the increased volume provided by sound amplification, and were paired with amplifiers in performance as early as the 1930s. It was not until the 1960s, however, that it was de rigueur for each instrument, including voice, to be given a dedicated amplifier specifically tailored to the characteristics of its timbre.

[11] It is often the case that there is a substantial time delay between when a technology is developed and when it gains general social usage, and thus a "social life." The model established by Geoffrey Moore with regard to "crossing the chasm" between "early adopters" and the "early majority" has been particularly influential. See Geoffrey Moore, *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers* (New York: Harper Business Essentials, 1991).

seeming contemporaries regardless of their own technological differences and historical and geographical particularities. Indeed, even sound amplification itself, in the form of an amplifier and a set of speakers attached to a sound source, became something of a musical instrument in its own right at this time.

0.1.1: Going Electric

Nonetheless, for a technological paradigm that was available to a majority of Americans by the end of the 1920s, it's curious that an electrified instrumentarium took so long to become de rigueur.[12] In a 1932 piece for *The North American Review*, an early literary journal, the prolific science and technology writer Raymond Francis Yates was struck by the resistance posed by the old guard of musical culture to these new instruments:

> Music, surely anchored in its almost sacred traditions, has always been serenely indifferent to the purely materialistic conquests of formal and dispassionate science in its department of sound physics. As a result, the evolution of musical media has been tediously slow, even stupid and resentful of anything that approached an invasion of its realm. This resistance has been anything but passive and the persistency with which it held gave subtle warning that when the invasion of science finally came it would be swift, sure and totally devastating.[13]

[12] In their analysis of the rates of adoption for electricity and information technologies, Boyan Jovanovic and Peter L. Rousseau position 1929 as a significant landmark when household adoption of electricity reached 70%. See Boyan Jovanovic and Peter L. Rousseau, "General Purpose Technologies," in *Handbook of Economic Growth*, Volume 1B, ed. Philippe Aghion and Steven N. Durlauf (Amsterdam; San Diego; Oxford; London: Eslevier, 2005), 1193-1194.

[13] Raymond Francis Yates, "These Musical Electrons," *The North American Review*, March 1, 1932, 233.

Surely such resistance was not predicated upon a dearth of options. By 1932 a diverse array of electronic instruments had already been developed by the likes of Thaddeus Cahill, Leon Theremin, Friedrich Trautwein, and Maurice Martenot. And while some enterprising composers like Joseph Schillinger, Henry Cowell, and Edgard Varèse engaged these novel sounds, by and large they remained in the margins of musical practice regardless of genre. The same can be said of amplified or "electric" instruments. For example, while the microphone and the electric guitar gradually became integral features of popular music, both were treated initially with a fair amount of hostility. Crooners, the first singers to explore the affordances of amplified singing, were dismissed by critics as "slushy" and "dishonest," while electric guitars were lambasted as distasteful and even dangerous. The history of electrical music instruments, then, is a history of intense polarization. On the one hand, an instrument's inventor and proponents might champion a new device for its sophistication and for the new, as-yet-unheard sounds that it would be capable of producing. And, on the other hand, an instrument's detractors might take issue with its legitimacy, arguing that it's not a "real" musical instrument or that its affordances have no place in the amalgam of styles and expectations that comprise the field of music at a given historical juncture.

In his history of the electrification of the United States, David Nye highlights the gradual application and spread of electrical technologies, which was governed both by social and technical logics: "Electrification is not an implacable force moving through history, but a social process that varies from one time period to another and from one culture to another."[14] He continues:

[14] David Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge, MA: MIT Press, 1992), ix.

> Rather, every institution is a terrain, a social space that incorporates electricity at a certain historical juncture as part of its ongoing development. Electrification is a series of choices based only partly on technical considerations, and its meaning must be looked for in the many contexts in which Americans decided how to use it.[15]

Music, broadly conceived, is such a "terrain," though it is itself internally divided. Indeed, there is an important disjunction between the pace at which electrical technologies were applied to practices of music consumption, music production (i.e. studio practices), and music performance. While the technologies used to manufacture and reproduce recorded music became electrified rather quickly, the technologies employed in the performances these recordings purported to document did not. The performers and performing groups that achieved widespread commercial success on disk in the first half of the twentieth century—opera singers, orchestras, vaudeville performers, big bands—worked primarily with a body of acoustic instruments that, by and large, had been available in their modern forms since the middle of the preceding century.[16] Furthermore, even with the advent of sound recording and radio broadcasts, much of these musicians' work remained situated in brick-and-mortar halls before live audiences. For many years after the advent of electrical sound recording, then, production aesthetics remained tethered to the notion of a real, live event—the stock-in-trade of most working musicians.[17] It was not until later in the century that genres native to this technology, such as rock, would emerge and

[15] Nye, *Electrifying America*, x.
[16] Two exceptions should be noted here. First is the acoustic guitar—both its arch-top and flat-top variants—which were developed by firms like Martin and Gibson in the late nineteenth and early twentieth centuries before experiencing major commercial growth during the dance band boom of the 1920s. Second is the drum set, which experienced a great deal of development during the 1920s and 30s before coalescing into its standard form by the middle of the 1940s.
[17] For a good survey of this topic, see David Morton, *Off the Record: The Technology and Culture of Sound Recording in America* (New Brunswick, NJ; London: Rutgers University Press, 2000), especially chapter two, "The End of the 'Canned Music' Debate in American Broadcasting."

participate in a gradual shift in the locus of the musical work from the performance that the recording documented to the recording itself.[18] Nonetheless, electrical sound technologies have been readily taken up in other fields of human practice. As Kyle Devine points out in his cultural history of the loudspeaker, the American public was regularly encountering these devices by the 1930s, not only for listening to music (whether at home on a radio or in public on a jukebox) but also for attending to sound piped through airports, public parks, and other spaces.[19] Some of the 1930s' musical fads, such as the Hawaiian guitar, did make conspicuous use of electrical amplification. Nevertheless, there remains a meaningful gap between ubiquity and normalization, and it would not be until far later in the century that the mere presence of an amplifier would begin to escape notice. The history of electricity in music is a history of shifting norms, expectations, and practices. It is a history of technologies moving in and out of view as the initial enchantment and outrage that they elicit is gradually tempered by familiarity.

0.1.2: Encountering and Categorizing Technology

Although the technological qualities of an instrument may be more or less overt given their historical, social, geographical, and generic context, all musical instruments are fundamentally technological in nature. Despite this, musical instruments have largely been absent from studies

[18] Albin Zak's *I Don't Sound Like Nobody* provides an excellent overview of the transition from recordings as documents of performances to recordings as works in themselves. As Zak explains, producers like Columbia's Mitch Miller championed the push toward a newfound focus on the "sound" of disk recordings during the 1950s. Indeed, the 1950s would bear witness a number of experiments in studio recording that would lay the groundwork for the electrical instruments I discuss throughout this project, including arrangements with unusual instruments like the harpsichord (chapter two) and unusual studio effects. But while much of the developments that Zak outlines were derided by critics as "gimmicks," the cultural climate of the 1960s proved more favorable to musicians generating records with a high degree of artifice. See Albin Zak, *I Don't Sound Like Nobody: Remaking Music in 1950s America* (Ann Arbor, MI: The University of Michigan Press, 2010), especially chapter two, "Shifting Currents in the Mainstream."

[19] Kyle Devine, "Imperfect Sound Forever: Loudness wars, listening formations and the history of sound reproduction," *Popular Music* 32/2 (2013): 159-176.

that take music and technology as their principal subject matter, a topic that has engaged scholars from a wide variety of fields, especially musicology, ethnomusicology, and communication studies. Despite the multitude of possible intersections between the two, such work has tended to focus above all on sound recording, new electronic instruments such as synthesizers and samplers, and hybrid instruments like the electric guitar. Following the previously quoted passage from Taylor above, we should note that the objects implicated in each of these categories call attention to themselves as technological in our present historical epoch by dint of their recent vintage. The perceptibility of such a technological quality has been an important requirement for selection as a topic for study, a dynamic that, in turn, continually reinscribes newness and novelty as fundamental requirements for an object's belonging to the category of "technology."

In an article concerning the application of Pierre Bourdieu's thought to the study of technology, Jonathan Sterne has emphasized both the importance and the difficulty of constructing the "object" of study in scholarship on technology because "technology," itself, is "preconstructed," and "the choice of a technological object of study is already itself shaped by a socially organized field of choices."[20] An object's status as a member of the category "technology," a social construct concerning what is often held to be the practical application of scientific knowledge, is not an inherent property of that object. When we admit an object to a category we make judgments about its most important features—those that it shares with other members of the group—and, in so doing, determine what kinds of questions are most pertinent to ask of it. One of my principal aims with this project, then, is to interrogate technology's shifting borders in order to ask questions concerning the roles that musical instruments play in the production and reception of musical sound. I contend that music as an aural-expressive medium

[20] Jonathan Sterne, "Bourdieu, Technique and Technology," *Cultural Studies* 17/3 (May 2003): 368.

is always mediated by musical instruments and thus always mediated by technology.[21] In particular, one of the central theses of this project is the idea that the meaning of music being described as "electric" or "electronic" is always shifting and is determined, in large part, against the way in which the creators of music make the presence of electricity felt against the norms of the genres in which they work. Therefore, my dissertation will make an important methodological contribution to the study of music history by attending to technology as a component part of any period's "horizon of expectations" and by considering the criteria by which individual instrument technologies come to be implicated in different categories.

In Hans Robert Jauss' work on the study of reception and influence in literary history, he uses the idea of a horizon of expectations to refer to a set of previous experiences and assumptions that readers bring to bear on their evaluation of a new work.[22] At its core, the horizon of expectations is a framework for making sense of and passing judgment on a work that is informed by past experiences of other, similar works. Jauss points out that authors use certain

[21] Even the human voice can be meaningfully understood as a piece of instrument technology. Though fleshy, the properties of what we call the human voice are the result of interactions between different component organs (the lungs, the larynx, the vocal folds, the diaphragm, etc.), which can be materially impacted by human knowledge and action, and mobilized toward musical ends. Put another way, these organs can be instrumentalized. This point is perhaps made most evident by considering the interventions of a surgeon, as in Bonnie Gordon's work on those celebrated "human machines" of the seventeenth century: the castrati. Although the human body might be understood to antedate the categories of objects that more typically fall within the remit of "technology," our knowledge of the human body is often shaped reciprocally by the very technologies fashioned with it. Gordon shows how our understanding of the mechanics supporting the production of vocal sound has often been made with reference to other instruments, such as the hydraulic organ. As such, consideration of the human voice apart from other kinds of machines can lead to an unhelpful dichotomy between humans and technology. As she concludes toward the end of the article: "The voice is associated with an experience that often comes across as utterly unmediated. To consider the castrato's constructed voice in the context of an early modern cyborg and machine culture is to insist that the voice is not only mediated, but that it is materially constructed." See Bonnie Gordon, "The Castrato Meets the Cyborg," *The Opera Quarterly* 21/1 (2011): 118. Even without the surgeon's knife, the training undertaken (or not undertaken) by singers constructs a voice, producing material effects on their bodies and necessarily affecting the function of their vocal apparatus. One such (negative) material effect is the production of polyps on the vocal folds, an issue that has come into focus as many professional singers have damaged their vocal cords and sought to repair them surgically. See, for example, Bernhard Warner, "Why do stars like Adele keep losing their voice?", *The Guardian*, August 10, 2017, accessed October 30, 2017, https://www.theguardian.com/news/2017/aug/10/adele-vocal-cord-surgery-why-stars-keep-losing-their-voices.

[22] Hans Robert Jauss, "Literary History as a Challenge to Literary Theory," in *Toward an Aesthetic of Reception*, 3-45 (Minneapolis, MD: University of Minnesota Press, 1982).

devices, such as the balance between fiction and reality or poetic and practical language, in order to suggest the use of one horizon over another. Although the devices available to composers and performers of music are, of course, different from those of the author of a work of literature, these devices nonetheless serve the same function of suggesting an appropriate horizon of expectations. Pertinent aesthetic devices might include, for example, harmonic vocabulary, balance between sections of improvised and written music, as well as the kinds of technology used to produce the music. Indeed, instrumentation—the technological element of music with which we are primarily concerned here—constitutes an important generic marker and provides us with vital clues regarding how we are to meaningfully interpret a given work.[23] Furthermore, it is important to recognize that authors are themselves recipients of texts. The horizon of expectations, then, also plays an important role in influencing the aesthetic decisions of authors.

Although technology is an important component of the horizon of expectations for musical genres, new music technologies are not developed and manufactured strictly according to a system of conventions governed by the production of musical texts.[24] Criteria and processes that are particular to the field of technology, such as transectorial innovation, also play an

[23] It is unlikely, for example, that a piece of music produced in the late 1960s and sounded by drums, electric guitar, and electric bass would be evaluated according to the horizon of expectations appropriate to classical music. Nonetheless, as Jauss notes, each successive work produces a corresponding change in the horizon of expectations by which it is evaluated. A work composed with instrumentation that is unusual for its genre might strike a reader by its "aesthetic distance," that is, "the disparity between the given horizon of expectations and the appearance of a new work, whose reception can result in a 'change of horizons' through negation of familiar experiences or through raising newly articulated experiences to the level of consciousness." See Jauss, *Toward an Aesthetic of Reception*, 25. Many concert works composed for instruments associated with rock, such as Glenn Branca's *Indeterminate Activity of Resultant Masses* (1981), Deep Purple's *Concerto for Group and Orchestra* (1969), and countless others, depend upon the horizon of expectations of classical music for their aesthetic import. By the same token, new music performance groups such as Bang on a Can, who regularly employ rock instruments, attest to a shift that has taken place within the horizon of expectations for classical music in the tail end of the twentieth century.

[24] User experience does, however, play an important role in shaping the forms and functions of music technologies. For a discussion of the role played by user groups in democratizing the production of music technologies, see Paul Théberge, "Communication Networks and User Groups: A Musical Democracy?" and "Consumption/Use: Technology and Musical Practice," in *Any Sound You Can Imagine: Making Music/Consuming Technology* (Middletown, CT: Wesleyan University Press, 1997).

important role.[25] Like art, technology constitutes a broad category of objects and social practices that is divisible into smaller parts according to its own internal logics, such as intended use (domestic, industrial, etc.) or technological principal (analog, digital, steam-powered, etc.). As I show in chapter one, these distinctions have important ramifications for how industries are structured, and the growing separation between the music industry and the electronics industry in the 1960s played an important role in circumscribing different categories of music technologies. Furthermore, as new technologies are produced, our assumptions regarding what technology does, what it looks and feels like, as well as the kinds of experiences that we have with it shift. We might thus speak of a horizon of expectations specific to technology, within which music technologies constitute a single type based upon usage, both intended and actual. This viewpoint is advantageous because it privileges an analysis of technology both as a text (how does it work from an internal, technical perspective?) as well as a special category of objects and knowledge whose meaning is constructed and negotiated in a social context.

The field of technology broadly conceived thus contains within it a body of technologies with musical application while, simultaneously, genres of music are structured by a variety of aesthetic principles of which technology comprises a single, yet important, component part. Technology and music may then be said to constitute two semi-autonomous fields of cultural practice, within which the production and reception of texts is governed by the field's own horizon of expectations as well as those of other fields with which it is connected. By attending to the dynamics of these two separate fields, as well as the effects produced by their interactions, I will be able to analyze situations where a criterion of value from one field, such as an object's

[25] For a discussion of the role of transectorial innovation within the production and development of music technologies, see Théberge, *Any Sound You Can Imagine*, 27-28.

being "technological" (produced within the field of technology), comes to have meaning within another.

But while technology and its usage comprises an important element in the conventions of musical genres, technologies themselves—including, of course, music technologies—might also be understood to constitute genres in their own right. As such, some of the theoretical developments that have taken place in popular music and genre studies might be fruitfully applied to the study of musical instruments as well. As I show throughout this project, especially in chapter two, the gradual application of electrical technologies to existing instruments prompted reconsideration of the principal commonalities that bound individual instances of that instrument together under a common category. For example, can an electric harpsichord still be considered a type of harpsichord if it dispenses with that instrument's signature jack mechanism, even if it produces a similar sound? One way of interrogating this problem is through consideration of the processes of citation that have produced the harpsichord category over time. As David Brackett writes in *Categorizing Sound*, musical genres are (re)produced through the production of new texts that refer to generic conventions that predate them. Over time, certain of these conventions stabilize to the point where they might be cited beyond their typical generic context (e.g. in a parody) and still retain legibility. But, because works produce the very genres that they are held to belong to, each new instantiation of a genre also bears the potential to modify its conventions, even if only slightly.[26] When applied to categories of musical instruments, the genealogical orientation of this theoretical framework can help to account for how certain of an instrument's features might shift over time and still be understood as belonging

[26] David Brackett, *Categorizing Sound: Genre and Twentieth-Century Popular Music* (Oakland, CA: University of California Press, 2016), especially 11-14.

to a common category. It can also be used to elucidate the interrelationships between a genre's conventions, the values it ascribes to technology, and the legibility of its instrumentarium as technology. Nonetheless, rapid technological change can also disrupt our comprehension of the boundaries of genre, and I show how the reception of these newly electrified instruments was shaped by the generic and instrumental affiliations of their critics.

This project, then, addresses the history of technology in postwar popular music from the perspective of electrical sound. Some of my primary objectives are to account for the development of new musical instrument technologies, their subsequent employment by musicians, as well as the sonic content and critical reception of the music thus produced. In order to elucidate these historical details, I will contextualize them within the general field of technological development. Indeed, as dominant technological paradigms shift, so too do the tools employed by musicians. The 1960s, for example, saw the gradual "transistorization" of devices such as amplifiers and phonographs, a process inaugurated by developments begun in the late 1940s and 50s. Furthermore, the values assigned to technology as a category, as well as specific individual technologies, are inflected by contemporary politics, world events, and the social imaginary. The period traced out by this project was marked by the decisively technological orientation of much of the Cold War, including the Space Race and the accumulation of nuclear armaments, as well as major developments in the realm of consumer electronics, especially with regard to miniaturization and mobilization. Headlines in music periodicals like "Are the machines taking over?" clearly speak to the importation of values about technology into the field of music from without.[27] Thus, I will seek to account for the meanings

[27] "Are the machines taking over?", *Melody Maker*, September 19, 1970, 37.

ascribed to music technologies and the cultural artifacts produced with them by a society whose attitude toward technology was decidedly ambivalent.

In the pages that follow, I will survey the existing literature concerning music and technology with a particular focus on the privileging of sound recording over other music technologies, including musical instruments. Following that, I will recommend the assemblage theory of Gilles Deleuze and Felix Guattari (and as elaborated by Manuel DeLanda) as a fruitful means for expanding our conception of musical instruments in order to better interrogate the foundational, mediating role that they play in all areas of musical experience. In addition, although the concept of the assemblage offers a powerful mechanism for explicating interactions between musicians and their tools, I recommend that its greatest analytical utility is to be found by bringing it into contact with a variety of theoretical premises developed within science and technology studies (STS), including actor-network theory (ANT) and the social construction of technology (SCOT).

0.2: Literature Review and Theoretical Concerns

0.2.1: Writing About Music and Technology

The profound impact on music and musical practices engendered by large technological developments such as sound recording and radio have proven to be particularly fertile subject matter for scholars of music and technology. A recent collection of primary sources edited by Timothy Taylor, Mark Katz, and Tony Grajeda, *Music, Sound, and Technology in America* (2012), positions the technological triumvirate of sound recording, cinema, and radio as the core

subjects of the study of music and technology.[28] Their work is largely concerned with establishing how music transitioned from a live, ephemeral event to sound as a commodity. Though the incorporation of these technologies into everyday life serves as the *telos* of their narrative, many of their chosen documents detail the effects that these technologies have had on the praxis of professionals, such as a set of instructions detailing how to adapt one's manner of singing for performance on radio or how best to conduct an orchestra for a phonograph recording. In *Capturing Sound* (2010) Katz delved more deeply into these issues by elucidating a variety of what he terms "phonographic effects," the myriad ways in which recording technology has had an impact upon the actions of its users including performers, engineers, composers, and so on.[29] Katz's work is valuable both for demonstrating that such effects can be perceived in any genre of music and for positing that technologies do not produce inevitable outcomes but, rather, that their impacts are produced through relationships with users.

While Katz and others such as Arved Ashby have made important contributions toward considering the role of sound recording within musical traditions that predated its emergence, such as jazz and classical, sound recording has been of especial import within the domain of genres whose emergence post-dated sound recording, including rock, hip-hop, and electronic dance music.[30] In his *Rhythm and Noise* (1996), for example, Theodore Gracyk argues that recording is the most characteristic medium of rock music, above and beyond the instruments that its musicians are understood to be playing. Indeed, guitars, basses, drums, and other instruments typically found in rock bands are, in Gracyk's formulation, secondary materials,

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[28] Timothy Taylor, Mark Katz, and Tony Grajeda, eds., *Music, Sound, and Technology in America: A Documentary History of Early Phonograph, Cinema, and Radio* (Durham, NC: Duke University Press, 2012).
[29] Mark Katz, *Capturing Sound: How Technology Has Changed Music* (Berkeley: University of California Press, 2010).
[30] For more on the relationship between recording technologies and classical music, see Arved Ashby, *Absolute Music: Mechanical Reproduction* (Berkeley and Los Angeles: University of California Press, 2010).

while the technology of the recording studio is understood to be primary. Influenced by the philosophical work of theorists such as Lydia Goehr and Nelson Goodman, Gracyk uses this inversion to explain new studio-based compositional practices that affect the ontological status of rock "works" as well as new structures of valuation that focus on "sound" (that is, timbre) over pitch and rhythm.[31] Albin Zak, too, in his *Poetics of Rock* (2001), accentuates the centrality of recorded music within the field of rock and positions recording as rock's most characteristic musical practice, thus highlighting the increased importance of the roles played by engineers and producers.[32] Simon Zagorski-Thomas' *The Musicology of Record Production* (2014) is another important study in this regard, as is his collection on *The Art of Record Production* (2012), co-edited with Simon Frith.[33] Zagorski-Thomas' work is significant for the way in which it argues for consideration of timbral and gestural elements alongside pitch and rhythm, as well as the interdisciplinary nature of his work; he draws heavily upon literature from STS, including ANT and SCOT, a disciplinary concern shared by this project.

The prevalence of studies on sound recording in popular music as well as the conflation of "sound recording" with "technology" in such discussions is not without its critics. Steve Waksman notes that popular music scholars have tended to take musical instruments for granted, conceptualizing them as the "always already" of musical practice, which he attributes to too much importance being placed on the mediating effects of recording. As he writes, "For all too many popular music scholars, musical activity does not exist for all intents and purposes before

[31] Theodore Gracyk, *Rhythm and Noise: An Aesthetics of Rock* (London and New York: I. B. Tauris & Co. Ltd., 1996).
[32] Albin Zak, *The Poetics of Rock: Cutting Tracks, Making Records* (Berkeley: University of California Press, 2001).
[33] Simon Zagorski-Thomas, *The Musicology of Record Production* (Cambridge: Cambridge University Press, 2014); Simon Frith and Simon Zagorski-Thomas, eds., *The Art of Record Production* (London: Routledge, 2012).

the moment of recording."[34] Théberge's *Any Sound You Can Imagine* (1997) marked an important contribution to the field by focusing attention on electronic instruments, specifically the digital synthesizers that emerged in the 1980s, and positioning them within the context of an emergent consumer culture of musicians. Indeed, he argues, that "an understanding of the various issues relating to music and technical innovation cannot be separated from a broader analysis of contemporary social and economic relations."[35] Taylor's *Strange Sounds* (2001) likewise stresses the importance of understanding musicians as consumers, but positions their consumption as an active and voluntary practice exercised in the service of self-construction. His chapter "Technostalgia," for example, interrogates the creative, consumptive acts of contemporary musicians who prefer the electronic instruments of the past to those of the present, especially with regard to their tactility and corresponding expressive potential, as well as their ability to signify the values of an earlier (and more utopian) period.

The object of a study of music and technology, then, can come in many forms, but it is nonetheless circumscribed by tacit understandings of what comprises the technological at any given historical juncture. A useful starting point for grasping the contours of these broad fluctuations comes from Théberge, who has posited a conception of music technology beyond "a random collection of instruments, recording and playback devices":

> Technology is also an environment in which we experience and think about music; it is a set of practices in which we engage in making and listening to musical sounds; and it is

[34] Steve Waksman, "Reading the Instrument: An Introduction," *Popular Music and Society* 26/3 (2003): 252.
[35] Théberge, *Any Sound You Can Imagine*, 5.

> an element in the discourses that we use in sharing and evaluating our experiences, defining, in the process, what music can be.[36]

This idea of technology as a framework for experiencing, evaluating, and understanding music provides rich opportunities for reception study, as such a framework is dependent upon the historical period, geographical locale, and social milieu in question. In this regard, scholars working on music from a wide variety of periods have emphasized the importance of understanding *how* music is made in order to begin to comprehend its meaning, including both compositional details and performance practice.[37] Within the field of musicology, the historically informed performance practice movement has been especially concerned with understanding the relationship between instrument technology and compositional style. Although the instrumentarium of Western concert music now appears rather more stable than that of popular music, changes in instrument design have nonetheless been an important consideration—whether explicitly or tacitly—for composers working in a written medium that leaves information about instrumentation relatively underspecified.[38] Tom Beghin's recent work on Franz Joseph Haydn, for example, highlights the composer's keen awareness of keyboard developments throughout his life and shows how the technical features of an instrument (such as that owned by the dedicatee of a sonata) might shape his compositional choices.[39]

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[36] Théberge, "'Plugged in': technology and popular music," 3.
[37] Examples of case studies that take this approach span a wide historical and geographical compass. For discussion of the challenge posed by synthesizers to the relationship between certain sounds and technical skill assumed to be required to produce them in rock music in the 1970s, for example, see Gracyk, *Rhythm and Noise*, 73-74. And for a discussion concerning the importance of knowing that a particular organ line is played by the feet rather than the hands see David Yearsley, "In Buxtehude's Footsteps," *Early Music*, 35/3 (2007): 339-354.
[38] For a discussion concerning the surprisingly long-term stability of the symphonic instrumentarium see Karin Bijsterveld and Marten Schulp, "Breaking into a World of Perfection: Innovation in Today's Classical Musical Instruments," *Social Studies of Science* 34/5 (2004): 649-674.
[39] See Tom Beghin, *The Virtual Haydn: Paradox of a Twenty-First Century Keyboardist* (Chicago: Chicago University Press, 2015), especially 27-42.

Nonetheless, ethnomusicologists have tended to be much more active in the study of instruments than have musicologists, and some recent writings have moved beyond previous ethnomusicological predilections for studying instruments in their native contexts in order to address the role that musical instruments play in an increasingly globalized world. Louise Meintje's *Sound of Africa* (2003) is exemplary in this regard; in her ethnography of a South African recording studio, she elucidates the role played by racial and ethnic identities, as well as state politics, in shaping the studio's practices, its attendant power dynamics, and the meanings ascribed to the music produced therein.[40] Paul Greene and Thomas Porcello's *Wired For Sound* (2005) is another important collection in this vein, as it highlights the growing application of electronic technologies in diverse musical cultures. But their organizing principle of "wired sound" refers not only to electronic instruments and recording studio technologies, but also "the contemporaneous fact that many of the world's musical practices are increasingly wired together"—that is, through flows of information and connectivity that traverse the entire globe.[41] In the introduction to their edited collection, *Music and Technoculture* (2003), René Lysloff and Leslie Gay advocate for an "ethnomusicology of technoculture," positing that such a discipline would be "concerned with how technology implicates cultural practices involving music." They continue: "To study technoculture, then, we must examine technologies not just as things—autonomous or neutral 'devices'—but as material culture that people use and experience in ways meaningful to their particular needs and circumstances."[42] This body of work marks an important widening of the lens of ethnomusicological studies to include the approaches of scholars working

[40] Louise Meintjes, *Sound of Africa: Making Music Zulu in a South African Studio* (Durham, NC: Duke University Press, 2003).
[41] Paul Greene, "Introduction: Wired Sound and Sonic Cultures," in *Wired For Sound*, ed. Paul Greene and Thomas Porcello (Middletown, CT: Wesleyan University Press, 2005), 2.
[42] René T. A. Lysloff and Leslie C. Gay, Jr., eds., *Music and Technoculture* (Middletown, CT: Wesleyan University Press, 2003), 7.

on material culture and technology studies.[43] The insights afforded by the coming-together of these disciplines will help me elucidate the shifting politics and cultural meanings of musical instruments by seeking out the social dynamics that bear upon their design and arise from their use.

In the past few years, several scholars have advocated for a new approach to organology that goes beyond the taxonomical project exemplified by works such as Curt Sach and Erich von Hornbostel's *Real-Lexikon der Musikinstrumente* (1913). Regula Qureshi's 2000 article on the Indian sarangi was an important early contribution, as she outlined an approach to studying musical meaning that bridged disciplinary gaps between ethnomusicology and anthropology, the latter of which had afforded greater consideration to issues of embodiment and memory, though not especially within the domain of musical experience.[44] This work fostered interest in the idea of a "critical organology," which was foregrounded explicitly by the ethnomusicologist Maria Sonevytsky in her 2008 article "The Accordion and Ethnic Whiteness: Toward a New Critical Organology." In order to elucidate the processes by which the accordion became the signifier of a kind of "ethnic whiteness" through its prominent public association with the American accordion player and television star Lawrence Welk, Sonevytsky employs a multidisciplinary approach. Specifically, she uses anthropological work concerning the "social life of things," such as that of Arjun Appadurai; cultural theoretical and philosophical writings that emphasize the symbolic value of objects, such as those of Theodor Adorno and Jean Baudrillard; material

[43] Indeed, in *Material Culture and Technology in Everyday Life*, editor Phillip Vannini highlights the congruity between the two fields, noting that the conceptualization of material culture and technology studies as being separate owes more to their different points of origin, both geographically (England/France and America, respectively) and with regard to discipline (anthropology and sociology, respectively). See Phillip Vannini, "Introduction," in *Material Culture and Technology in Everyday Life: Ethnographic Approaches*, ed. Phillip Vannini (New York: Peter Lang, 2009), 3.

[44] Regula Qureshi, "How Does Music Mean? Embodied Memories and the Politics of Affect in the Indian 'sarangi'," *American Ethnologist* 27/4 (2000): 805-838.

culture studies; and ethnomusicological literature focused on specific musical instruments in specific cultural contexts.[45]

Musicologist Emily Dolan has more recently taken up the project of a critical organology. Her book, *The Orchestral Revolution: Haydn and the Technologies of Timbre* (2012), examines, through the oeuvre of a single composer, how conceptions of orchestration and timbre shifted over the course of the late eighteenth century, a pivotal period in the development of the modern orchestra.[46] Her approach incorporates recent developments in literature concerning the history of science that interrogates not only scientific *ideas* but scientific *instruments*. A variety of approaches to this theme were presented in a special 2013 issue of *Osiris* entitled "Music, Sound, and the Laboratory from 1750-1980," which included an article co-written by Dolan and John Tresch entitled "Toward a New Organology: Instruments of Music and Science." This article, heavily influenced by Foucault's writings on ethics, develops a methodology for the "systematic study of the natures, uses, degrees of agency, and ends of instruments in different fields and at different times" in order to understand the changes and continuities in how instruments—both musical and scientific—have been used and understood. Their case studies explore a range of intersections between the histories of music and science, which they believe will help elucidate broader relationships between the arts and the sciences, as well as humans, nature, and technology.[47] The diverse methodologies adumbrated by Qureshi, Sonevytsky, Dolan, Tresch, and others broaden the interdisciplinary approaches introduced by ethnomusicologists like Meintjes, Greene, Porcello, Lysloff, and Gay, while further refining them for specific application

[45] Maria Sonevytsky, "The Accordion and Ethnic Whiteness: Toward a New Critical Organology," *The World of Music* 50/3 (2008): 101-118.
[46] Emily Dolan, *The Orchestral Revolution: Haydn and the Technologies of Timbre* (Cambridge: Cambridge University Press, 2012).
[47] John Tresch and Emily I. Dolan, "Toward a New Organology: Instruments of Music and Science," *Osiris* 28/1 (January 2013): 278-298.

toward musical instruments. These critical organological works serve as models for the case studies that I will undertake in chapters two through four, and a number of the ideas that they have brought to bear upon the studies of instruments have been incorporated into my own theoretical approach.

0.2.2: The Theory of Affordances

An important development in the theoretical discourse around musical instruments in recent years has been the application of the concept of the "affordance" in the study of music and music technologies, including the work of Mark Butler and Robert Strachan.[48] In its current usage, the term originates in the work of the ecological psychologist James J. Gibson, who was concerned with elucidating how animals (including humans) were capable of successfully navigating their environments by extrapolating cues about the nature of its features and the various kinds of actions these features might enable.[49] Gibson describes environmental features as combinations of "substance" and "surface" (i.e. material and geometry). The various combinations of these two parameters afford a variety of different uses, but animals learn that recurring combinations of the two may be used in a consistent way. Indeed, Gibson argues that animals are ultimately less concerned with the qualities of environmental features than what they afford and regards affordances themselves as "invariant combinations of variables": "the object offers what it does because it is what it is."[50] This reduction in difference (objects are their functions) allows an

[48] See Mark Butler, *Playing with Something That Runs: Technology, Improvisation, and Composition in DJ and Laptop Performance* (Oxford: Oxford University Press, 2014); and Robert Strachan, *Sonic Technologies: Popular Music, Digital Culture and the Creative Process* (New York; London: Bloomsbury, 2017).
[49] See James J. Gibson, "The Theory of Affordances," in *Perceiving, Acting, and Knowing*, ed. R. E. Shaw and J. Bransford, 67-82 (Hillsdale, NJ: Lawrence Erlbaum Associates, 1977); and James J. Gibson, *The Ecological Approach to Visual Perception* (Boston: Houghton Mifflin, 1979).
[50] Gibson, "The Theory of Affordances," 78.

animal to make sense of a complex environment by reducing it to relevant use values, and many of Gibson's examples bear this out by focusing on how different objects afford things like sleep, shelter, or even danger. Crucially, Gibson's theorization of affordances focuses on visual perception and how animals come to perceive affordances. For Gibson, affordances are always present—that is, they exist independently of the observer—but they cannot be utilized unless they are perceived.

This insight has had important ramifications in other fields, especially design. Don Norman utilizes Gibson's formulation of the affordance in his influential *The Design of Everyday Things* (originally published in 1988), a treatise on the relationship between human psychology and good design practices.[51] By building upon the idea that what can be done with an object is circumscribed by what can be perceived about it visually, Norman argues that designers should incorporate easily intuitable, "natural" signifiers into their products, which instruct users about their proper functioning. A door, for example, might incorporate a flat square of material opposite its hinge to indicate the correct site for pushing, while the opposite side might incorporate a handle to indicate that it should be pulled rather than pushed. Feedback is also an important aspect of design for Norman, and he derides the design of his office's telephone system because of its buried functionality, its arbitrary relationships between commands and functions, and its lack of relevant visual feedback when executing a task such as putting a caller on hold. While a complex, modern phone system affords such operations, their designs fail to convey appropriate information about how to access these affordances. Like Gibson then, Norman holds an affordance to exist independently of any particular user, and it is the task of the designer to make them apparent. Because the types of objects that Gibson and Norman are

[51] Don Norman, *The Design of Everyday Things* (New York: Basic Books, 2013).

dealing with are understood to have only proper or improper uses, there's little room in their conceptualization of the affordance to acknowledge the taste, predilections, or idiosyncrasies of a given user. How then might the concept of affordance speak to an aesthetic domain like music, which privileges a much more subjective conception of "correctness"?

The concept of the affordance has found increasing application in the study of musical practice and experience since the early years of the twenty-first century, especially by an interdisciplinary body of scholars concerned with elucidating how listeners make use of music, such as Tia DeNora, Joel Krueger, and Eric Clarke.[52] The term has also been applied increasingly by those writing about musical instruments, especially those concerned with the design of interfaces for use in computer-based musical practices such as EDM. Mark Butler, for example, uses the term to describe the diverse interfaces used by EDM musicians as "sites of possibilities," rather than deterministic instruments furnishing inevitable outcomes.[53] Because many of these musicians are utilizing computers to handle tasks of sound generation and manipulation, the interfaces by which they control these resources take on an additional importance. Indeed, many of the musicians he discusses double as instrument builders and design their own interfaces, such as Robert Henke, whose Monodeck suits both his creative process and physiognomy better than anything commercially available. Nonetheless, even many commercial controllers allow for a wide variety of parameter mapping, which affords users with numerous options to tailor the instrument to their individual proclivities. The flexible nature of

[52] See, for example, Tia DeNora, *Music in Everyday Life* (Cambridge: Cambridge University Press, 2000); Joel Krueger, "Doing Things with Music," *Phenomenology and the Cognitive Sciences* 10/1 (2011): 1-22; and Eric F. Clarke, *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (Oxford: Oxford University Press, 2005).
[53] Butler, *Playing with Something That Runs*, 72.

these devices highlights the possibility of considering instrument building as a foundational component of many musical practices.

Robert Strachan's recent *Sonic Technologies: Popular Music, Digital Culture and the Creative Process* (2017) places the affordance front and center in its theorization of the relationship between digital technologies and creativity. Building on the work of scholars like DeNora, Krueger, Clarke, and others, Strachan posits a distinction between "musical" and "sonic" affordances.[54] Acting upon a musical affordance depends upon sonic material being recognized as music, and therefore subject to the interplay of sociocultural forces that bear upon its meaning, value, and use as such. Sonic affordances, by contrast, are available without being considered as part of a musical system, and a sound's material properties affect how it might be used. Strachan uses the example of a gunshot—marked by its loudness and transient character—to explain how a sound might afford an incitement to run away, such as when the implement is being wielded by a dangerous individual. This distinction, however, points to the social mediation of affordances; a different context, such as a race, might furnish the sound produced by a fired gun with another affordance (e.g. knowledge that the race has started, soliciting an adrenal response from its participants, etc.).[55] Thus, as Strachan suggests, both musical and sonic affordances depend upon a degree of listener competency in order to be acted upon.

Strachan's explication of the relationship between a sound's material properties and affordances is particularly illuminating when he discusses a collaborative project with the pianist Anni Hogan. Working with recordings of Hogan's playing in Ableton Live, Strachan finds that

[54] See Strachan, *Sonic Technologies*, especially chapter three.
[55] Strachan, *Sonic Technologies*, 88-89.

different snippets of sound afford different types of structuring and transformation in a new work he is producing based upon them:

> For this project the original tracks are taken less as "piano pieces" than as sonic source materials that will be utilized in varying ways. The musical affordances apparent in the original tracks are taken in a variety of directions—sometimes according to their directly "musical" properties (pitch, melody, etc.) while in others they are taken on a purely textural level whereby particular sonic qualities become a starting point to stretch out the material into new shapes and terrains.[56]

As raw materials, Hogan's recordings may be taken in totally new directions, their sonic content interpolated by the transformative possibilities offered in digital audio workstation (DAW) environments like Live. This mediation of the sound through Live allows Strachan to become aware of aspects of Hogan's playing that may not have been otherwise perceptible. In this respect, Live itself becomes a kind of actor, not only contributing tools for working with sound and music but also, by virtue of the technological and aesthetic priorities inscribed in its design, shaping Strachan's own perception of his materials. As such, Strachan endeavors to explain how the fields of human-computer interaction (HCI) and user experience design (UX) inform the design of software that is meant to be intuitable by musicians. Strachan's study bears out the point that music-making software is never totally neutral or transparent, but speaks to a history of competing technological principles (computer technology as distinct from music technology) and about what kinds of sounds and actions might be considered musical.

[56] Strachan, *Sonic Technologies*, 83.

0.2.3: Assemblage Theory

The work of scholars like Butler and Strachan offers much to musicologists for thinking through some of the unseen forces shaping the contours of musicians' interactions with their instruments. But while the theory of affordances does take consideration of a subject's perceptive faculties, which may ultimately be faulty, the affordance is nonetheless held to be intrinsic to the object itself, existing independently of any user. To return to Gibson: "the object offers what it does because it is what it is."[57] Indeed, from a perspective centered on design, musicians and their performative acts must be treated in an idealized way. That is, while the features built into their tools may be the result of historical contingencies—as authors like Strachan have clearly illustrated—once they are established it is merely the task of the musician to properly understand and to realize these features. But while idealized users might serve as a useful construct for research, development, and marketing, they do not accurately describe the multiple mediating layers of circumstance that might disrupt a user's ability to grasp an affordance. That is, the Gibsonian conception of affordances assumes a monolithic individual, unencumbered by the countless, intersecting factors that might structure one's experience of the world, including race, gender, (dis)ability, and so on. As Brian Bloomfield, Yvonne Latham, and Theo Vurdubakis write in their critique of the affordance: "Rather than talk of *an* individual encountering *an* object… we need to talk instead of *how* and, importantly, *when* specific action possibilities emerge out of the ever-changing relations between people, between objects, and between people and objects."[58] Affordances, then, are not solely the product of an object's material properties. Rather, the human body, social engagements, and the (built) environment—of which technology

[57] Gibson, "The Theory of Affordances," 78.
[58] Brian Bloomfield, Yvonne Latham, and Theo Vurdubakis, "Bodies, Technologies and Action Possibilities: When is an Affordance?", *Sociology* 44/3 (2010): 420.

is a component part—continually produce each other, enabling and/or restricting action at any given juncture.

Building upon these critiques, I contend that the theory of affordances does not go far enough to highlight the contingent nature of sound production *in situ*, as an event. Rather than a mere encounter between artist and materials, those aspects of a musical performance that hearers find most compelling often emerge in interactions between a huge array of disparate agents. In chapter three, for example, I discuss a collaborative relationship between Jimi Hendrix and an electronics engineer called Roger Mayer, who served Hendrix's band, the Jimi Hendrix Experience, in a capacity similar to that of a guitar technician. One of Mayer's contributions was to service Hendrix's gear, including his guitar pedals. Hendrix is well known for his use of the Dallas Arbiter Fuzz Face, but the germanium transistors used in these devices were both subject to a wide fluctuation in their component values during manufacturing and terribly sensitive to environmental factors such as temperature. Thus, Mayer was useful to Hendrix for his ability to regulate these potentially disruptive elements. While an analysis of Hendrix's instrument rooted in affordances would surely note that his fuzz pedal, amplifier, and other equipment might offer certain performance possibilities beyond the electric guitar itself, such an analysis would also miss the way in which the unique properties of a Hendrix performance emerge from an interaction between a wide variety of other actors, both on stage and off. Though invisible to Hendrix's audiences, we can glean new insights into his work by considering his sound as emerging through the reciprocal actions carried out by Hendrix himself, his on-stage equipment, his band, Mayer, the fluctuating heat in the room, contemporary manufacturing processes and regulations, and surely others. What language can we use to better grasp the scope of the interactions at play in such examples?

The idea of an "assemblage," first described in the collaborative writings of Gilles Deleuze and Félix Guattari (yet primarily attributed to the former), provides a compelling method for comprehending the full range of agents employed in the production of musical sound, whatever their nature.[59] At its core, the idea of an assemblage concerns the relationship between a whole and its parts: it is a heterogeneous collection whose component parts interact in such a way that the whole may display emergent properties and exercise capacities that are unique to it and not directly reducible and attributable to the properties of its component parts. Deleuze uses the term "relations of exteriority" to describe these productive interconnections.[60] Because capacities emerge through interaction they can only be expressed and encountered through time, like music, as events. Indeed, this theoretical framework proves especially fertile for musicologists, who can begin with the event and work backwards to elucidate the various agents that ultimately shape it.[61] An assemblage is also "decomposable" meaning that its component parts can be detached from the assemblage and plugged into new ones, from which new properties and capacities will emerge. Even at a purely metaphorical level, the language of the assemblage will no doubt feel

[59] In *A Thousand Plateaus*, Deleuze and Guattari employ the concept of the assemblage in order to describe and contemplate a huge range of phenomena, including examples from both the social and natural worlds, including the synthesizer. While discussing the music of Edgard Varèse in their famous chapter on music, "Of the Refrain," Deleuze and Guattari write of the composer's "sound machine": "If this machine must have an assemblage, it is the synthesizer. By assembling modules, source elements, and elements for treating sound (oscillators, generators, and transformers), by arranging microintervals, the synthesizer makes audible the sound process itself, the production of that process, and puts us in contact with still other elements beyond sound matter." See Gilles Deleuze and Félix Guattari, *A Thousand Plateaus* (Minneapolis, MD: University of Minnesota Press, 1987), 343. Later authors have continued to reiterate the range of phenomena that may be accounted for using the concept of assemblage. In his entry in on the assemblage in *The Deleuze Dictionary*, for example, Graham Livesey writes, "the concept of assemblages applies to all structures, from the behaviour patterns of an individual, the organisation of institutions, an arrangement of spaces, to the functioning of ecologies." See Graham Livesey, "Assemblages," in *The Deleuze Dictionary*, ed. Adrian Parr, 18-19 (Edinburgh: Edinburgh University Press, 2010). Manual DeLanda's own theoretical explication of the assemblage allows for the possibility of both inorganic and organic assemblages. See Manuel DeLanda, *A New Philosophy of Society: Assemblage Theory and Social Complexity* (London: Continuum, 2006), especially "Assemblages Against Essences," 26-46.

[60] For a more detailed explanation of these terms, see Manuel DeLanda, *A New Philosophy of Society*, especially 8-11; and Manuel DeLanda, *Assemblage Theory* (Edinburgh: Edinburgh University Press, 2016).

[61] The event might just as easily include a live, real-time performance as it would a long recording process involving overdubbing, or even the audition of a recording.

familiar to any musician who has ever connected the two ends of an instrument or microphone cable, plugging two (or more) objects together and, in so doing, engaging in a minor act of instrument building.[62]

These basic premises open up crucial paths of inquiry into thinking through musical instruments. Though specific examples will be introduced in each of the following chapters, a preliminary example will help to clarify the application of some of these terms. First, the assemblage can help us to identify a single instrument comprised of a broad arrangement of networked objects. For example, as Kai Fikentscher has pointed out, the instrument typically employed by deejays is comprised of several discrete objects—including, at a minimum, two turntables and a mixer—that are nonetheless conceptualized as a single "set" or "console."[63] In addition, Butler has argued that the haptic feedback provided by the distinctive feel of the vinyl record itself is essential, and cannot be disentangled from the whole instrument: "the record's surface serves as part of the interface."[64] He argues that it is the simultaneous operation of all of these devices that enables the artistry of the deejay to emerge because the possibilities for sound production and manipulation proffered by the turntables' and mixer's co-functioning far exceed what is possible within their independent usage. Furthermore, it can help us to see how performance practices (such as "beat matching" and "crab scratching") and expressivity emerge as capacities in assemblages comprised of both humans and machines. Any deejay might be aware that the console affords these techniques, though they will be incapable of realizing them

[62] Given that this dissertation is concerned principally with electrical instruments and instrument technologies, the majority of my examples will deal with assemblages patched together with cables. Nonetheless, the basic theoretical premise of the assemblage is equally amenable to thinking through the construction of acoustic instruments, as well.
[63] Kai Fikentscher, "'There's Not a Problem I Can't Fix, 'Cause I Can Do It in the Mix.': On the Performative Technology of 12-Inch Vinyl," in *Music and Technoculture*, ed. René T. A. Lysloff and Leslie C. Gay, Jr. (Middletown, CT: Wesleyan University Press, 2003), 298.
[64] Butler, *Playing with Something That Runs*, 74.

without the requisite manual dexterity. Nor is sufficient skill necessarily a homogenizing force; phrasing comes in many flavors, and the contingent nature of emergent capacities lends itself well to contemplating the subjectivity inherent in aesthetic judgment.

Despite the widespread influence of Deleuze's philosophical ideas, scholars have noted the difficulty of extracting a clear theoretical methodology from his writings. Manuel DeLanda has written several publications that have attempted to clarify Deleuze's ontology and his formulation of the assemblage, beginning with *Intensive Science and Virtual Philosophy* (2002), *A New Philosophy of Society* (2006), and ultimately culminating with *Assemblage Theory* (2016). Furthermore, DeLanda has proposed modifications to the concept in order to make assemblages more amenable to the analysis of a variety of different phenomena. One of DeLanda's principal modifications is the addition of "coding" as a parameter of assemblages, which serves as a means to discuss how well defined the identity of an assemblage is based upon linguistic structures such as rules.[65] Religions, for example, are coded by their sacred texts, which outlines the distribution of authority based on an appeal to the sacred origins of such structures.[66] Over time such an organization may become more or less defined (such as when a single religious group bifurcates into two separate sects), highlighting the historically contingent nature of assemblages. This move enables DeLanda to account for variations in how well defined the identity of an assemblage remains over the passage of time and space without having to declare the emergence of a new ontological category.[67]

[65] While Deleuze distinguishes between assemblages and "strata," a more homogenous assemblage characterized by "coding," DeLanda abandons strata altogether in favor of parametrizing assemblages according to this property. For a detailed discussion of DeLanda's modification of this concept, see DeLanda, *A New Philosophy of Society*, 123-124n21.

[66] DeLanda, *A New Philosophy of Society*, 15.

[67] One of the defining features of the Deleuzian assemblage is its productive quality. As Graham Livesey has written, "An assemblage emerges when a function emerges; ideally it is innovative and productive. The result of a productive assemblage is a new means of expression, a new territorial/spatial organisation, a new institution, a new behaviour, or a new realisation. The assemblage is destined to produce a new reality, by making numerous, often

DeLanda's parametrized conception of coding might fruitfully be used to discuss both tacit and explicit understandings concerning the intended usage of musical instrument technologies. Instruction manuals, advertisements, and recurrent patterns of common practice might increase an assemblage's level of coding. By contrast, we might say that whenever an assemblage comes to exercise an unorthodox capacity it undergoes a process of decoding. A good example of this kind of decoding can be observed in the emergence of various deejay techniques that involve physical manipulation of a vinyl record with the hand, such as "scratching" and "back spinning." Prior to the advent of these techniques, the turntable, embedded in the home stereo assemblage, served a primarily sound-reproducing role. By disobeying the then-tacit rules of the assemblage and exercising different capacities of the hand (the hand, it should be noted, has always been involved in this assemblage in order to turn the power on, move the stylus, turn records over, etc.) the assemblage's identity has been destabilized. And yet, over time, these innovatory functions might themselves become codified. For example, while the instruction manual for the Technics SL-1200mk2, a turntable released in 1978 that became commonly used in live deejay performances, includes no reference to the practice of "scratching" records, the manual for the Stanton STR8.150, a more recent device produced expressly for the modern deejay, speaks directly to the possibility of this practice.[68] Furthermore, the present division of the general category of turntables into separate subsets intended for hi-fi home stereo playback or live deejay performance testifies to an even greater degree of codification than was present previously.

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unexpected, connections." DeLanda's elimination of the category of "strata" is not in contradiction with this feature of assemblages. Rather, it implies that this productive function is present in inverse proportion to an assemblage's degree of coding. That is, a heavily coded assemblage is less innovative and productive than one that is heavily decoded. See Livesey, "Assemblage."

[68] Regarding adjustment of the tone arm and cartridge settings, the manual for the Stanton STR8.150 states the following: "If you are using these 1/2" mounted products with a headshell in a mobile application or you are doing heavy scratching, you may want to use an extra shell weight." See *Stanton STR8.150 Digital Turntable Owner's Manual*, accessed January 15, 2015, http://www.stantondj.com/pdf/products/turntables/STR8-150OwnersManual03_18_2013.pdf.

Another foundational premise when thinking through assemblages is the idea that they are "nested." That is, assemblages are themselves comprised of assemblages. In *Assemblage Theory*, DeLanda shows how a change in the components of an assemblage at one level can have cascading effects throughout the other assemblages of which it is a component part. Using the example of technological development and changing military organization, he explains:

> By modelling [sic] armies as assemblages of assemblages and allowing each nested level to have its own parameters, we can capture the complex interactions between levels. Changes in the parameters at one level (weapons) can be shown to have a cascading effect on the parameters of the larger assemblages of which they are parts (increased accuracy and range for individual soldier-rifle assemblages) that, in turn, affects the parameters of even larger assemblages: the increased lethality of entire armies that forced the abandonment of tight formations.[69]

If we replace DeLanda's army with an ensemble, we can see how these cascading effects might be analyzed in a musical performance. In a small combo group, the substitution of one musician for another can have a radical effect on the interactions unfolding over the course of a performance, whether aural, bodily, affective or otherwise. Similarly, a recurrent musician employing a new instrument can be similarly "deterritorializing," as the instrument may affect the aural and tactile feedback experienced by the musician in unanticipated ways, furnishing unforeseen consequences for the group as a whole. Musicians of course are well aware of this, and reconfigure their own instruments and groups as a means toward achieving a desired result.

[69] DeLanda, *Assemblage Theory*, 71.

Because assemblages are always nested, significant effects might be produced at a variety of different levels. It is therefore the analyst's task to identify and elucidate those sites of interaction deemed to furnish the most explanatory power for the phenomenon at hand.

0.2.4: Actor-Network Theory

While Deleuze and Guattari's notion of the assemblage (and DeLanda's elaborated theory of it) might furnish analysts with a new set of tools with which to interrogate the overlapping layers of connection and interaction that support and shape musical events, it has rather less to say about the role played by human thought and practice in guiding the encounters with technologies that produce these sounds. Nevertheless, this is clearly an important line of inquiry, even for the aforementioned philosophers themselves. DeLanda, for example, describes the importance of social determinants in shaping how humans select for different capacities in a common object depending upon its intended function: a stone will be used differently for war or for work.[70] And, in a passage from *A Thousand Plateaus* highlighted by DeLanda in *Assemblage Theory*, Deleuze and Guattari likewise indicate that "It is… the social or collective machine, the machinic assemblage that determines what is a technical element at a given moment, what is its usage, its extension, its comprehension, etc."[71] How, then, to theorize these thoroughly social engagements?

Actor-network theory (ANT), a subset of sociology set in motion by scholars such as Bruno Latour, Michel Callon, and John Law in the 1980s, shares a number of important conceptual premises with Deleuzian philosophy and can provide a productive theoretical

[70] DeLanda, *Assemblage Theory*, 72.
[71] Deleuze and Guattari, *A Thousand Plateaus*, 398.

framework for thinking through the technological practices of musicians. For my purposes here, I'm particularly interested in ANT's skepticism toward a priori categorical distinctions, the way in which it seeks to elucidate things in motion (becoming rather than being), and the emphasis that it places on agency. In *Reassembling the Social*, a kind of handbook on the preoccupations and methodologies of ANT, Latour adumbrates these distinctions by outlining the differences between what he terms "classical" and "relativist" sociologies. While a classical sociology seeks to explain its subject against a fixed conception of reality, a relativist sociology seeks to learn about the nature of reality from its subjects, "from those who are constructing society."[72] While these might very well be people, they can just as easily be non-human agents. As Latour writes in *Aramis*, his study of an automated public transportation system in France that ultimately never came into existence, the construction of networks is not the exclusive domain of individuals and social groups: "motors, activators, doors, cabins, software, and sensors. They, too, have their conditions; they *allow* or *forbid* other alliances. They require; they constrain; they provide."[73] Put another way, as Latour and Callon explain: "Our empirical program does not claim either that humans and artefacts are exactly the same or that they are radically different."[74] This notion of a flat ontology, which necessitates an analytical symmetry between human and non-human agents, is characteristic of this approach.

One of the principal advantages of this premise is the way in which it privileges serious consideration of agents that might otherwise escape notice. For example, Benjamin Piekut, in a 2014 article outlining the potential application of ANT within a musicological context, has

[72] See Bruno Latour, *Aramis: Or the Love of Technology*, trans. Catherine Porter (Cambridge, MA; London: Harvard University Press, 1996), 199-200.
[73] Latour, *Aramis*, 57.
[74] Michel Callon and Bruno Latour, "Don't Throw the Baby Out with the Bath School! A Reply to Collins and Yearley," in *Science as Practice and Culture*, ed. Andrew Pickering (Chicago: University of Chicago Press, 1992), 360.

highlighted the foundational role played by the circulation of low-priced compilation records in supporting the emergence of what he identifies as a "vernacular avant-garde."[75] In this regard, then, flows become as important as individuals in explicating the emergence and function of this music-historical phenomenon. Likewise, such a flat ontology might also enhance our understanding of the complex interactions and relations that comprise technology. In chapter four, for example, I discuss the New York-based band Silver Apples and their home-made electronic instrument, the Simeon. While the makeshift character of the instrument was itself fascinating for music critics, the performances that they were entranced by were the product of wide array of intersecting agents—both human and non-human—including environmental factors (e.g. temperature, humidity), the electrical supply, electrical component manufacturing practices, affective states, prior knowledge of the instrument's propensity toward unanticipated behavior, the performer's desired musical outcome, and so on. While many of these elements are no doubt present in nearly all contemporary musical performances, it is the task of the analyst to show how they make a significant difference in a particular musical context. Reception study is a strong way to support this kind of reading, and I elaborate the nature of the primary source materials that I draw upon in this project toward the end of this section.

0.2.5: The Social Construction of Technology

To recapitulate, then, the analytical symmetry asserted by ANT is a useful way to highlight agents whose difference-making actions might otherwise go unnoticed. Nonetheless, the explanatory mechanisms that it privileges may not necessarily be the most useful in all

[75] Benjamin Piekut, "Actor-Networks in Music History: Clarifications and Critiques," *Twentieth Century Music* 11/2 (2014): 200.

situations. For example, as the examples presented throughout this project show, musicians, fans, and critics tend to maintain an important distinction and hierarchy between musicians and the equipment they use, and this conceptual framework has meaningful repercussions for the way in which they evaluate music. While the methodological tools of ANT support certain of the claims that I make concerning the agency of musical instruments, its analytical symmetry, as well as the skepticism that it holds toward the category of society, can also obstruct understanding of the grounds upon which these sources' claims were predicated.[76] As such, I also draw upon another body of literature in order to better understand period discourse about musical experience: The Social Construction of Technology (SCOT), a social constructivist subset of STS pioneered by writers like Trevor Pinch and Wiebe Bijker.

One of SCOT's principal theoretical tools is the idea of "interpretive flexibility." This idea was first put forth within the Empirical Programme of Relativism (EPOR), a subset of the sociology of scientific knowledge. It holds that, because scientists might produce more than one interpretation of a natural phenomenon, a scientific "fact" cannot be reduced to nature alone and thus the production of scientific facts necessarily has a crucial sociological component. Pinch and Bijker describe how the term can be adapted to the study of technology:

> In SCOT, the equivalent of the first stage of the EPOR would seem to be the demonstration that technological artifacts are culturally constructed and interpreted… By this we mean not only that there is flexibility in how people think of or interpret artifacts

[76] For a critique of ANT's analytical symmetry from a SCOT perspective, see Trevor Pinch, "The Social Construction of Technology: The Old, the New, and the Nonhuman," in *Material Culture and Technology in Everyday Life: Ethnographic Approaches*, ed. Phillip Vannini, 45-58 (New York: Peter Lang, 2009).

> but also that there is flexibility in how artifacts are *designed*. There is not just one possible way or one best way of designing an artifact.[77]

For Pinch and Bijker, designers are especially important analytical subjects because their interpretations of technology are manifest not only through their use of existing technologies but also in the way in which they apply those understandings to subsequent technological developments. Though designers of musical instruments are present in each of the four chapters presented here, I take up this issue most overtly in chapter two, which addresses the electrical adaptation of foreign and historic instruments by Western instrument manufacturers. By attempting to make instruments like the harpsichord and the sitar amenable to the praxis of 1960s popular music, these designers necessarily made significant decisions about which of these instruments' features were essential to maintaining their identity as such. The fact that a variety of different electric harpsichord and sitar designs were produced within a relatively short span of time reveals the presence of competing interpretations of these instrument technologies, a point that must also be reconciled against the significant cultural and temporal gaps separating these designers from these instruments' initial social contexts and musical application.

This line of thinking has important ramifications for an argument concerning music instruments presented by Jacques Attali in his book *Noise* (1985), a text that has enjoyed wide influence within the field of popular music studies. Attali thoughtfully views instruments as constituting an explorable "field of knowledge," and Steve Waksman, in his reading of this text, expands this to acknowledge that "instruments are crucial to this search for knowledge through

[77] Trevor Pinch and Wiebe Bijker, "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, ed. Wiebe Bijker, Thomas P. Hughes, and Trevor Pinch, 17-50 (Cambridge, MA; London: The MIT Press, 1989), 40.

sound because they are the nexus at which the abstract codes of music-making meet the material acts through which music is produced."[78] Nonetheless, a full consideration of how such knowledge might be sought through musical instruments is stunted by Attali's belief that acts of musical expression are inherently limited by the tools used through which they are manifest: "inducing people to compose using predefined instruments cannot lead to a mode of production different from that authorized by those instruments."[79] To suggest that instruments so thoroughly determine musical expression gives little room for humans to (re-)interpret an instrument's form and affordances. We can go beyond this shortcoming of Attali's text by considering some of the lessons from SCOT. While it is true that musical instruments always impose a limit on the range of produce-able sounds, the full scope of their possible musical application is rarely, if ever, fully envisaged by their designers. This point has been elaborated by Madeline Akrich in her work on the concepts of "inscription" and "de-scription." As she writes, designers "inscribe" a vision or a prediction of the world into the technical content of their objects.[80] But these objects will necessarily be encountered and used by individuals who do not necessarily share these same visions. As such, she argues that we cannot focus solely on the point of view of the designer or user alone and, rather, need to move between them: "between the world inscribed in the object and the world described by its displacement."[81] Indeed, Akrich's analysis is reminiscent of the "hard wires" discussed by Paul Greene, the "particular logic" built into every technology.[82] Interpretive flexibility is a productive way to address the apprehensive slippages between

[78] Steve Waksman, *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience* (Cambridge, MA: Harvard University Press, 1999), 11.
[79] Jacques Attali, *Noise: The Political Economy of Music* (Minneapolis: University of Minnesota Press, 1985), 141.
[80] Madeline Akrich, "The De-Scription of Technical Objects," in *Shaping Technology/Building Society: Studies in Technological Change*, ed. Wiebe E. Bijker and John Law (Cambridge, MA; London: The MIT Press, 1992), 208.
[81] Akrich, "The De-Scription of Technical Objects," 209.
[82] Greene, "Introduction," *Wired for Sound*, 5.

designers and users and can help us to account for the fluidity of a technology's meaning across different social groups by focusing on how they reinterpret and ascribe new meanings and uses to technologies, even those that may seem quite obdurate in another milieu.

Another important theoretical concern within SCOT is to elucidate the significant role played by social actors in defining the problems that they seek to solve with technological development. This idea is perhaps best encapsulated by the idea of a "technological frame," which was first introduced by Bijker in his essay on the development of Bakelite included in *The Social Construction of Technological Systems* (1989). Bijker uses the concept to provide an explanation as to why the possibility of producing a synthetic plastic out of phenol and formaldehyde escaped—or, at least, did not interest—a group of chemists working at the end of the nineteenth century after the cost of formaldehyde had fallen precipitously. Though many of these chemists were working with formaldehyde for other purposes, such as the production of dyes, they did not see its use for the production of plastics because of their technological frame. Likening it to the idea of Thomas Kuhn's paradigm, Bijker explains:

> A technological frame is composed of… the concepts and techniques employed by a community in its problem solving… This makes [it] a combination of current theories, tacit knowledge, engineering practice (such as design methods and criteria), specialized testing procedures, goals, and handling and using practice.[83]

[83] Wiebe Bijker, "The Social Construction of Bakelite: Toward a Theory of Invention," in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, ed. Wiebe Bijker, Thomas P. Hughes, and Trevor Pinch (Cambridge, MA; London: The MIT Press, 1989), 168.

Thus, while these chemists encountered phenol-formaldehyde resins as byproducts in other experiments, they did not consider their commercial value because they were external to the technological frame structuring their practice. Put another way, their experience working as chemists at a particular historical juncture in pursuit of a concrete set of professional goals informed how and what they were able to see in the materials that they worked with.

This idea was later adapted by Wanda Orlikowski and Debra Gash in a 1994 article detailing the implementation of a new piece of software called Notes at a large consulting firm. They found that the different technological frames held by the company's users and technologists strongly determined their understanding of the nature of Notes and, subsequently, its purpose. These understandings, in turn, had major ramifications for the eventual patterns of use that built up around the software amongst these different groups. While the average user tended to see Notes as an individually oriented productivity tool similar to programs with which they were already acquainted, the technologists, by contrast, were aware of the software's deeper functionality to facilitate new kinds of workflows that were not available with other programs. Orlikowski and Gash's study, then, focuses largely on the gaps between these two major groups' understanding of Notes, and they introduce the term "congruence" to describe the distance between their technological frames.[84]

Bijker and Orlikowski and Gash thus posit different structural relationships between individuals, groups, technologies, and technological frames. For Bijker an individual can be more or less included in a given frame, which is tied to a particular technology. As Bijker writes, technological frames "are located *between* actors, not *in* actors or *above* actors," and his

[84] Wanda J. Orlikowski and Debra C. Gash, "Technological Frames: Making Sense of Information Technology in Organizations," *ACM Transactions on Information Systems* 12/2 (1994): 199.

description emphasizes the way that they form gradually after technologies become obdurate and users' interactions with them become fixed.[85] Given Bijker's impetus to write a social constructivist history of technological development that does not privilege the concept of genius, this approach helps to situate Baekeland's innovation in relation to other, related work being done. By contrast, for Orlikowski and Gash, the technological frame is a kind of average of the consensus about a technology within a given group. Because they are concerned with large personnel structures in corporate environments, dealing with broad categories of technological users is important. In their study, the incongruence between the users' and technologists' frames could be taken as a measure of failure in the implementation of Notes. Both, however, are clearly concerned with showing how familiarity with technologies structure future encounters with other technologies. This premise is taken up throughout all of the following chapters, as I show how different types of musical instruments structure both users' and designers' perceptions and experiences of other types of instruments.

0.2.6: STS and Aesthetics

Before departing from STS and turning to the chapter summaries, it's worth pausing for a moment to consider the relationship between STS and a consideration of aesthetics. In an unpublished article on Max/MSP, co-written by Georgina Born and Joe Snape, the authors identify a lacuna in STS concerning a given technology's situatedness within a domain governed by aesthetic considerations. Recognizing the fundamental role that materials play in shaping notions of beauty, pleasure, and success, the they ask: "Where is the aesthetic located—in the

[85] Bijker, "The Social Construction of Bakelite," 172.

medium, format, hardware, software, interface, or reflexive medial gesture?"[86] For example, the authors highlight the way in which distinct ideas about musical time and structure are built into programs like Max/MSP because the software privileges some operations while making others more difficult. While live sound processing and event generation are relatively easy to do with Max, many operations typical of other software environments, such as synchronous playback of multiple samples, are comparatively difficult. The result, then, is that the software—open-ended as it is—nonetheless imbues the music made with it with what Born and Snape term a certain "Maxness," a critical trope that is often used to disparage work that fails to overcome the aesthetic inertia of the software. Max/MSP, then, is both a technology and a strong determinant of the aesthetic frameworks governing the music made with it.[87] Because shifting technological frames restructure what we expect in different generic contexts, reconstructing the debates concerning new instrument technologies at the point of their emergence is a necessary step in the process of situating these devices not only in a history of technology but also in a history of aesthetics.

The intertwined relationships between the material, technological, and aesthetic dimensions of music foregrounded by Born and Snape can certainly be applied to other instrument technologies as well. Central to the analytical methodology employed throughout what follows, then, are deep readings of period discourse, which serve to elucidate how these technologies interfaced with a diverse array of evaluative frameworks deployed by musicians, fans, and critics. To this end I interrogate a range of opinion expressed by the mainstream press (*The New York Times*, *Life*), fan-oriented music magazines and papers (*Melody Maker*, *New*

[86] Georgina Born and Joe Snape, "Max, Music Software, and the Mutual Mediation of Aesthetics and Digital Technologies," unpublished.
[87] Born and Snape, "Max, Music, Software," 15.

Musical Express, *Rolling Stone, Hullabaloo*), the music industry press (*Billboard*, *Variety*), periodicals specific to the musical instrument trade (*Musical Merchandise Review*, *Music Trades Review*), a variety of regional papers, and more. These period accounts are then used to orient my own musical analyses of selected musical texts, which typically take the form of sound recordings. Where it may be helpful for clarifying the discussion at hand, I have included transcriptions of pitch-based and rhythmic elements from these works. But, given this project's focus on those aspects of musical sound and experience that are affected by electrical instrument technologies, many of the most important details pertain to timbre. As such, my discussion of these works incorporates terminology that would be familiar to most musicians working in a rock idiom, which often borrows metaphorical language from the other senses (e.g. "warm," "dark," "bright," etc.) or refers to aspects of sound that seem to express information about the material composition of its source.[88]

0.2.7: A Note on Sources

Each chapter in this project includes a wealth of information drawn from print media. Because the nature of these sources—including their subject matter, intended audience, and circulation size—are rather varied, it will be worth spending some time to consider what these sources can provide and how I employ them, as well as any potential cautions that should be flagged in advance. Chapter one, for example, relies heavily on two trade periodicals, *Musical Merchandise Review* and *Music Trades Review*, which represent the interests and concerns of the American and British instrument trades, respectively. Because much of their content is written by industry leaders, who officially function as the public faces of large instrument firms, retail outlets, and

[88] Albin Zak refers to this latter category as "spectrographic translations." See Zak, *The Poetics of Rock*, 65.

trade associations, their ability to speak for the trade as a whole is established by the economic success of the institutions they represent. This marks an important divergence with two of the other major trade periodicals I discuss, *Billboard* and *Variety*, whose content tends to be written by journalists representing their publication rather than another business or institution. While both sets of sources cater to instrument and (in the case of *Billboard* and *Variety*) disk retailers, we will see that the second set tends to be much more open with respect to new trends, as its writers are not also a hegemonic force within the trade with vested interests in particular types and categories of instruments.

A second important set of sources for this project are the many fan-oriented music magazines published during the 1960s, especially in the UK. Indeed, the steady march of the British music weeklies *Melody Maker* and *New Musical Express* generated such a wealth of debate about musical styles and trends that discourse analysis centered on 1960s Anglo-American popular music can easily become unbalanced in favor of the British perspective. While I have focused on these sources extensively in sections of this project focused exclusively on the UK, especially section 2.5, I have attempted to draw upon a wide range of sources in the United States that might construct a broad, if more uneven, picture of contemporaneous developments across the pond. The end of the decade fares best, as American rock publications like *Crawdaddy!* and *Rolling Stone* began to reshape the field of fan-oriented discourse, while upper-middle-brow publications like *The Village Voice*, *The New Yorker*, and *Esquire* hired their own staff rock critics. Because they also included record reviews, trade periodicals like *Billboard* and *Variety* can help to fill in some gaps in the American picture earlier in the decade, though it is important to consider that these magazines were marketed to music retailers rather than fans. In my discussions of lesser-known groups, such as Silver Apples in chapter four, I have drawn upon

a range of small, regional papers, which often constitute the only available documentary evidence attesting to how such groups were received at the time. Wherever possible I have drawn upon the testimony of multiple critics in order to substantiate their impressions. My hope is to convey that, while these critics may have had little impact on public consciousness at a national level, they nonetheless were not isolated in their evaluations of this music.

A final source in this project that bears special mention is the British periodical *Beat Instrumental* (*BI*), née *Beat Monthly* and later rechristened *Beat Instrumental & International Recording Studio*. As one of the first periodicals to address the craft of popular music, especially with respect to questions about instrument technology, its contributions have weighed heavily on this project as a whole. This is especially true in chapter three, which parses the myriad points of contact between the aesthetics of popular music and its practitioners' application of technology. Because *BI* long regarded the practice of popular musicians as a serious, skill-based enterprise, in its earliest years of publication it presented a near-solitary voice on these matters. Nonetheless, although it was not circulated as widely as the other British music magazines, the practice-based orientation of the magazine was later adopted by other publications, especially *Melody Maker*, as guitar-centric amateur music-making in the UK continued to rise over the course of the decade. But while *BI*'s ability to represent the broader field of popular music discourse shifted over the course of the decade, the magazine's editors were nothing if not metacognitive, and explained in several of the magazine's features how *BI* was fundamentally different from the music weeklies and why it was important for them to stake out their distinct position. As such, the dispersed community of readers that emerged through *BI* was well aware of the linkages drawing them together, and the passages from the magazine that I highlight in my analyses should be read as expressive of a particular type of "serious" fan engaged with popular music as a fundamentally

technological craft. It should also be read as an exceedingly male terrain, a point about which I will have more to say in the next chapter.

I'd like to conclude this section on sources by highlighting one further type of utterance: the fan letter. Given that both opinions and fashion change on a regular basis—especially within the domain of popular culture—I have endeavored to avoid granting undue importance to any single voice. Important agents in this study, such as music critics and industry leaders, do reconsider their opinions over time, and wherever possible I have attempted to contextualize both the change and stability of recurrent voices by attending to the history of their thought diachronically. This problem is rather more exacerbated, however, for reader letters, which are nearly always solitary expressions of an individual about whom nothing else may be knowable. Thus, in these cases I have sought to connect singular utterances within larger discursive patterns presented in a given source. The choice to print a reader's letter is just that: a choice. As such, letters are an important part of a larger set of editorial practices that build the world expressed by any periodical. Indeed, it is significant to note that one of the most frequent types of letters printed in the smaller magazines addressed in this study (e.g. *Hullabaloo*, *Beat Instrumental*) are those that describe the source's most unique features and contributions, thus granting it a manner of authority on such matters. Thus, the letters written to and published in these sources speak to the sources' own significance, the (admissible) range of opinion held by each's audience, and the importance of the source itself as the proper forum for settling any disagreements.

But the role that print media plays as a barometer of public and expert opinion—however large or small—is also problematized by its additional role as a vehicle for marketing. Because advertising is a crucial source of revenue for nearly all print media, there is always a potential for content to be compromised by the impetus to generate revenue. (This is especially obvious in the

case of "advertorials" and, especially in online media, the prevalence of so-called "native" content.) But even in sources where advertisements are not prominently featured, such as the early issues of Paul Williams' *Crawdaddy!*, editorial and journalistic content about music nonetheless participates tacitly in the production of taste and desire, whether for the periodical itself or any of the huge variety of musical commodities described in its pages (including, especially, sound recordings and concert tickets). As such, while I attend to the separate imperatives of marketers, critics, and editors in my discourse analysis, I would also suggest that it is important not to overstate a categorical distinction between content and promotion, as if a clear break between the two was tenable. I take up this point in further detail toward the end of chapter one, in my discussion of the teen magazine *Hullabaloo*.

0.3: Chapter Outline

This project comprises four main chapters. The first, "Plugging Into the 'Switched-On' Market," provides an overview of the postwar development of the American and, to a lesser extent, English music industries. These industries' economic outlook at the beginning of the 1960s was optimistic, but the central role to be played by popular musicians and their electrified instrumentarium could yet not be foreseen. This chapter highlights the close association between electrical instruments, rock music, and youth audiences, which provides a framework for the case studies addressed in chapters two, three, and four. Each of these three chapters addresses a particular electrical instrument or category of instruments and uses them as a framework to interrogate a variety of aesthetic and philosophical issues in popular music from the perspective of a major set of its tools. Taken together, these four chapters provide a roughly chronological look at the development of the instrument trade throughout the 1960s, the growing role played by

electrical instrument technologies in that trade and in popular culture, as well as an overview of the most important applications of electrical technology in instrument design and performance.

0.3.1: Chapter One

While chapters two through four address specific electrical instruments and the music made with them, chapter one focuses on the music instrument industry and its reactions to the rising commercial prospects of amplified instruments. I begin with an analysis of the positive economic forecasts and attitudes expressed by the music trades at the beginning of the 1960s through their major press outlets, *Musical Merchandise Review* (USA) and *Music Trades Review* (UK). Because the instrument trade is comprised of organizations representing the interests of those affiliated with a particular instrument or category of instruments, I examine the way in which its prognostications were shaped by these associations. Of especial import was the trade's longstanding focus on keyboard instruments, especially the piano, and the way in which these interests shaped reactions to the growing application of electrical technologies in the design and manufacture of musical instruments. The first part of the chapter uses the Beatles' famous February 9, 1964 performance on the Ed Sullivan show as a kind of fulcrum between two different conceptions of the principal function of electricity in instrument design: automation and amplification. Although in both cases electricity was viewed as a potential threat to established concepts of skill and legitimate musical expression, the arrival of the Beatles and their British colleagues also helped to solidify an emergent association between electrical instruments and youth culture.

In the second half of the chapter I examine the surge that took place in teenage music making in the middle of the decade and the central position occupied by amplified instruments in

accounts of this phenomenon. Numerous commentators have focused especially on the amount of money being spent by teenagers (and their parents) on electrical music equipment, with figures for outfitting a full ensemble regularly totaling thousands of dollars. Though these bills may, from time to time, be symptomatic of a gap between real and imagined expenditures, the buzz surrounding these purchasing habits exerted a profound effect on the trade as a whole, whose embrace of electrical instruments only expanded as the decade progressed. In order to illustrate this, I examine a number of promotional campaigns carried out by instrument manufacturers in order to cultivate a market of musical amateurs by appealing to their aspirations to (someday) become professional. This kind of dream merchandising also supported growth in the publication of "how-to" articles addressing a variety music industry-related topics, especially in teen-oriented music magazines like *Hullabaloo*. Indeed, I conclude the chapter by interrogating *Hullabaloo* as a case study in the growing intersection between teenage lifestyle marketing and the prosumer culture of amateur musicians and show how the style and range of the magazine's features emphasized musical instruments as desirable consumer objects on account of both fashion and function.

0.3.2: Chapter Two

Following the sudden mid-decade surge in electric guitar sales, instrument designers and manufacturers worked to cash in on the swing toward electrical instruments by developing electrified versions of "everything from the autoharp through the zither," as one *Billboard* writer put it.[89] In the wake of the British Invasion, the contours of the industry's product development agenda became increasingly determined by the popular charts, as retailers and industry leaders

[89] "Tomorrow's Sounds Are Today's Sales," *Billboard*, July 1, 1967, WS-52.

grasped the power of star musicians to create significant consumer interest in an instrument. And one of the most important trends during the mid-1960s was a sudden proliferation of recordings featuring sounds produced with a variety of seemingly "ancient" and "exotic" instruments including the sitar, harpsichord, dulcimer, and others. What attracted popular musicians to these sounds? How did they use them? And how did the form and function of these instruments change as they were incorporated into new musical practices?

Chapter two, "'Amplified Ancients': Fashioning new 'old' sounds," focuses on the harpsichord and the sitar, two of the most widely featured instruments on popular recordings from beyond the rock instrumentarium, and five electrical instruments designed to imitate them. In each case, I begin by situating the instrument's emergence into popular music practice, including details about how the instruments were juxtaposed against or blended into the rock instrumentarium, and conclude by interrogating the designs of their electrical variants as practical solutions intended to adapt them to contemporary, Western musical practice. I open the chapter with a discussion of the harpsichord and a variety of discourses employed to contextualize its application in different genres of twentieth-century popular music. The harpsichord's material and social features were mobilized to suit a variety of aesthetic goals, and I show how different genres played with its high-cultural connotations, distinctive timbre, and elements of the baroque idiom with which it is closely associated. I then turn to three electric harpsichords, the Baldwin electric harpsichord, the RMI Rock-Si-Chord, and an instrument described in a patent filed by the Allen Organ Company's Jerome Markowitz, in order to understand how different designers conceptualized and attempted to preserve the core of the instrument's identity in the face of its many impracticalities for use in other musical contexts.

In the second half of this chapter I trace two key moments in the sitar's journey through the popular music landscape of the mid-1960s. I begin by examining the critical reception of Anglo-American popular music featuring the instrument, where it functioned as a focal point in debates concerning the growing prestige and symbolic capital accorded to popular musicians during what Bernard Gendron has described as rock's "cultural accreditation."[90] Through its incorporation into popular music recordings, the sitar, in turn, gained newfound exposure and popularity. But while manufacturers were eager to exploit the commercial potential of the instrument, it presented a number of practical problems for musicians trying to use it in the recording studio and on stage. The second part of my analysis, then, concerns the development of "electric sitars" by two American firms: Danelectro and Rajah. I situate their hybrid designs as flexible interpretations of the sitar and a strategic response to three interrelated phenomena: (1) an emergent Western market for sitars, comprised principally of guitarists; (2) widespread engagement with the sitar as a kind of "exotic" guitar effect; and (3) a growing market for specialty guitars. The instrument thus embodies the mediating role played by the guitar in the encounter between eastern and western musical practices during the "great sitar explosion" of the 1960s.

I conclude with a question of classification: are these electric instruments what they claim to be? Is an electric sitar a sitar? Is an electric harpsichord a harpsichord? While the significance of the Danelectro and Rajah instruments are rooted in their connection to the sitar, many of their most significant features, including their six-string interfaces, speak more closely to the design of an electric guitar. Indeed, there is something paradoxical in the fact that these electric sitars

[90] See Bernard Gendron, *Between Montmartre and the Mudd Club: Popular Music and the Avant-Garde* (Chicago: University of Chicago Press, 2002), especially chapters eight and nine.

could be easily picked up and played by a guitarist but, perhaps, not by a sitarist. Likewise, the RMI and Baldwin harpsichords both incorporate radical alterations in their designs that throw their organological belonging into question. I therefore position the electric sitars and the electric harpsichords as "counter-instruments," a term derived from Markowitz's electric harpsichord patent.[91] Counter-instruments exist in relation to a pre-existing instrumental category, from which they derive their symbolic import. Drawing upon Brackett's theory of citation and iteration in the (re)production of musical genres, I show how a counter-instrument's belonging to its parent category is strongly shaped by the musical-generic enculturation of a given observer.[92]

0.3.3: Chapter Three

One of the many byproducts of the developments in sound recording technologies and practices in the 1960s was a pronounced, newfound separation between the sonic affordances of the stage and the studio.[93] Such a gap was especially problematic for rock musicians, as rock has typically held up live performance as its ideal. But as the contributions of technical personnel like engineers and instrument builders became aesthetically significant in new ways throughout the decade this paradigm became increasingly difficult to maintain. In chapter three, "(Dis)honest Music: Authorship and Authenticity Between Stage and Studio," I elucidate a range of strategies employed by rock musicians in order to bridge the gap between stage and studio and therefore reassert the transparency of their collaborators and equipment. I argue that the impetus driving these efforts is rooted in the nature of the actions and processes that furnish recognition as an

[91] Jerome Markowitz, "Electronic Harpsichord Loudspeaker Arrangement and The Like," US patent 3,064,515, filed August 22, 1961, and issued November 20, 1962.
[92] Brackett, *Categorizing Sound*.
[93] This discrepancy provided much of the impetus for developing electrical variants of harpsichords, sitars, and other acoustic instruments addressed in the previous chapter.

author in 1960s rock culture, and show how rock musicians have endeavored to produce authorial status in their live and recorded performances, as well as in their discourse. These dynamics highlight a dichotomy between authorship as a kind of state or status and authorship as a fact explaining a work's genesis, and ask us to attend to the way in which generic conventions obscure certain kinds of agents and actions.

I begin by examining a set of tropes in the critical response to psychedelic rock that positioned this music as somehow "dishonest." In order to contextualize this judgment, I trace the emergence of a governing concept of "authenticity" through the mass culture critiques of authors such as Theodor Adorno and its operation in genres peripheral to rock, like folk and blues.[94] Although it remains difficult to say with unerring precision what constitutes rock authenticity, it nonetheless functions in a very specific way: to legitimate certain works by virtue of their apparent difference from the vacuity of mere entertainment (i.e. pop). For this difference to work properly, the rock work needs to be attributable to an author, and the work needs to be produced and transmitted in such a way that the communicative act encapsulated in the work (whether a live performance or a recording) is perceived as direct, unmediated, and therefore uncorrupted.[95] But if rock authenticity depends upon a work having a single author (whether an individual or a group), how do we reconcile this aesthetic precept against the fundamentally collaborative nature of recording?

The three main case studies in this chapter present three different ways of interrogating this fraught relationship between technological development and the primacy accorded in rock

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[94] See, for example, Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment: Philosophical Fragments*, ed. Gunzelin Schmid Noerr, trans. Edmund Jephcott (Stanford, CA: Stanford University Press, 2002), especially "The Culture Industry: Enlightenment as Mass Deception," 94-136.

[95] This type of authenticity corresponds to what Allan Moore would term "first person" authenticity. See Allan Moore, "Authenticity as Authentication," *Popular Music* 21/2 (2002): 214.

culture to what Paul Greene terms "an originary presence of actual voices, bodies, instruments, or performances."[96] Because the personnel of a group are an integral part of their brand identity, and because rock culture places a high value on the idea of autonomous production, the use of session musicians and creative feats of engineering needs to be tightly managed in an effort to preserve the communicability of this "originary presence." While the studio allowed acoustic instruments and wild, electronic effects to sound balanced against the rock instrumentarium, these resources proved especially challenging to incorporate convincingly in a live environment. My first case study addresses rock groups, such as Vanilla Fudge, who seized upon this discrepancy in order to espouse what I describe as a "quasi-realist" recording aesthetic, which is characterized by the way in which it restricts the sonic affordances of the studio but nonetheless takes advantage of its procedural offerings, such as multitrack recording.

My second case study focuses on Jimi Hendrix and his collaborative relationships with the electronics and audio engineer Roger Mayer, as well as his recording engineer Eddie Kramer. Like Vanilla Fudge, Hendrix and his group, the Experience, focused on producing recordings that could be recreated in live performance. Nonetheless, their recordings demonstrate a wide variety of novel sounds and effects. I argue that the possibility of translating these sounds between studio and stage environments was facilitated both by Hendrix's unique mastery of the electric guitar and the contributions of Mayer and Kramer. Through an analysis of their collaborations and discourse about their work together, I use the example of the Jimi Hendrix Experience to show how only certain types of action in a collaborative enterprise might furnish recognition as a rock author. The discrepancies that emerge here are useful for highlighting the

[96] Greene, "Introduction," *Wired for Sound*, 10.

difference between authorship as a status and authorship as a fact, an idea that I explore in more detail in the chapter's conclusion.

My third case study concerns emerging anxieties about the disembodiment of sound production engendered by the possibility of diffusing sound-modulating action between a performer and a network of electrical equipment, such as amplifiers and effects pedals. But while these technologies helped to inaugurate a new style of idiomatic electric guitar performance, critics were often concerned that such sounds were too strongly determined by the equipment and therefore problematized evaluation of a performer's skill. Borrowing from Alexander Refsum Jensenius' "action-sound" theory of musical causality, I show how the novel mediations offered by fuzz and distortion scrambled critics' grasp of the electric guitar's functionality.[97] As part of an effort to shape critical reception of their work, I analyze discourse published by virtuoso musicians like Eric Clapton who attempted to explain his techniques in order to establish the difficulty inherent in their execution. Because demonstrable skill and musicianship are integral to the brand of performers like Clapton, this kind of discourse would prove increasingly important as new electronic instruments like the synthesizer would further reconfigure the nature of the action-sound relationships at play in the production of popular music.

0.3.4: Chapter Four

Without a doubt, throughout the 1960s, popular music's being-electrical was one of its most salient features, and critical opinion about the value, legitimacy, and possibility of these new

[97] Alexander Refsum Jensenius, "An Action–Sound Approach to Teaching Interactive Music," *Organized Sound* 18/2 (2013): 178-89.

technologies and techniques ran the full gamut. But electricity can be applied in the production of music in a variety of ways and toward a variety of outcomes, and the actual referent of terms like "electric," "electrical," and "electronic" shifted alongside changing tastes and the gradual normalization of new technologies and techniques. One of the central theses in chapter four, "High Tech/Low Tech: The synthesizer and 'electronic music' in rock discourse," is that the term "electronic," as it is applied to music, needs to be read against a horizon of technological expectations; a musical work may be perceived as more or less "electronic" than another not necessarily by virtue of an actual difference in the nature of the technologies employed in their production, but rather by virtue of how those technologies are transformed into a meaningful and marked component of the content of the work itself. Put another way, because electrical technologies like microphones and loudspeakers are endemic to popular music, the argument that some music is "electronic" is not predicated upon an opposition between "electronic" and "acoustic"—as it typically is in histories of electronic music penned within the concert-hall tradition—but, rather, between transparently electronic and aesthetically electronic.

In the late 1960s the synthesizer played a special role in reshaping the field of electrical possibility in rock music. If the volume of electrical amplification had symbolized the difference of British beat music from earlier styles, by the end of the decade the "electronic-ness" of popular music was more readily located in the novel, unworldly sonic transformations of psychedelia and its offshoots. But as the synthesizer began to enter rock culture, it had a profoundly destabilizing effect on the technological frame of rock's instrumentarium, if only momentarily. The modular synthesizers produced by companies like Moog were comparatively open-ended instruments, developed to furnish both new sounds and new ways of interacting with sound. Rock musicians were enticed by this prospect, but working with these instruments

required expertise beyond their ken, and, after a limited number of more exploratory recordings like George Harrison's *Electronic Sound* (1969), the synthesizer as a rock instrument coalesced quickly into the hardwired keyboard instruments of the 1970s and beyond. But if the synthesizer's subsequent development was strongly shaped by the knowledge, attitudes, and needs of rock musicians, it had a reciprocal influence on these same determinants and strongly inflected rock's evaluative discourses. In particular, the last years of the 1960s bore witness to the emergence of a sharp divide between "high-tech" and "low-tech" instruments predicated upon the complexity of the synthesizer relative to rock's other instruments. As I explain in this chapter, this dichotomy proved to be especially important in the critical reception of two rock groups employing homemade instruments: San Francisco's Fifty Foot Hose and New York's Silver Apples. While the synthesizers of companies like Moog were prohibitively expensive for all but the most elite rock groups, Fifty Foot Hose and Silver Apples built their own electronic instruments, and the make-do quality of these devices proved favorable to critics. The quality of their music was measured against the challenges presented by their instruments and of overcoming their perceived limitations.

I conclude the chapter by looking at how the technological frame engendered by the synthesizer's entry into rock conditioned the reception of earlier music *ex post facto*. My case study here centers on an Austin, TX-based group called the 13th Floor Elevators. Positioned in the interstice between psychedelic and garage rock, the group is perhaps best remembered for their early adoption of the word "psychedelic" to describe their own music, their commitment to playing whilst under the effects of LSD, and the mental health struggles of their frontman, Roky Erickson. The group was also unusual for featuring an amplified jug, played by member Tommy Hall. The instrument, however, was a source of conflict amongst the group members and

ambivalently received during their tenure as a band, and I show how the makeshift quality of homemade instruments like a jug could serve to withhold legitimacy within the cultural milieu in which the band participated. Nonetheless, Hall's jug has come to occupy a central position in the group's posthumous reception and is now widely recognized as one of their most distinctive features. Crucially, modern reception has tended to liken the sound of Hall's jug playing to the sound of a synthesizer, a point of comparison that did not readily exist for the group's contemporaries. As such, the instrument has been reclaimed and rehabilitated as a kind of "proto-synthesizer." Furthermore, like the instruments of Fifty Foot Hose and Silver Apples, the "low-tech" quality of the jug further heightens its remove from the synthesizer, and Hall's once-derided performances become all the more remarkable for it. The example of the 13th Floor Elevators and their electric jug serves to demonstrate how the emergence of new technologies alongside changing habits of use can shock even obdurate objects into taking on new meanings.

Chapter 1 | Plugging into the "Switched-On" Market

"Two of today's popular rock 'n roll guitarists were told rather indignantly by a serious music lover: 'You shouldn't be allowed to call yourselves musicians.' The rock 'n roll guitarists adjusted the output controls on their amplifiers, so they could be heard, and replied: 'Lady, nobody said we were musicians... just call us electricians.'"[1]

It seems a fitting place to begin a history of the switching-on of 1960s popular music with an account of the resistance encountered in that very movement. This anecdote, printed in the January 1960 issue of the cinema fan magazine *Picturegoer,* highlights a number of themes that recur throughout this chapter—and, indeed, throughout this project as a whole—including the roles that categories play in shaping our interpretations and experiences of the world, as well as the power of entrenched arbiters of legitimacy to delimit those very categories. Although it can seem humorous in hindsight to encounter such invective in a world that has come to prominently feature both the electric guitar and electrical amplification more generally, these technologies were still hotly contested in a variety of musical fields in the early 1960s, already many decades after they had first been introduced. Electrical instruments encountered resistance not only from "serious" music critics, who decried the volume produced by groups like the Beatles and their many peers and imitators, but also from the instrument trade, which had little faith in the commercial prospects of "faddish" instruments like the guitar even as its sales figures were rising precipitously at this very moment.

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[1] "Current Pops," *Picturegoer*, January 2, 1960, 12.

This chapter traces out the mixed reception of the rising application of electrical circuits in the design of musical instruments from the perspective of the Anglo-American instrument trade and music press. I begin by looking at the burgeoning economic prospects forecasted for the trade in the early 1960s, and examine how its structure and history shaped its attitudes about electricity in instrument design, as well as the ends toward which it might be applied. I suggest that the overwhelming focus on keyboard instruments and hard-sell dealing within the trade oriented it toward a set of concerns that left it in a position to be startled by the massive popular success of the Beatles, their British colleagues, and their booming instrumentarium. Although this moment signaled a marked shift in the trade's tactics, I adumbrate a variety of considerations that contributed to its ongoing reticence, which stalled a wholehearted embrace of these technologies. I conclude with an extended reading of the pop magazine *Hullabaloo*, which serves as an instructive example for how new types of media might foster a discursive space capable of circumventing the concerns of "serious music lovers," and assigning positive value to the rock instrumentarium according to criteria internal to teenage culture in the mid-1960s.

1.1: Musical Merchandising Comes of Age

"In 1947, there was public apathy toward making one's own music. Today, public participation in music making is at an all-time high and promises to continue to rise."[2]

The 1960s began on an optimistic note for music instrument manufacturers and dealers. In trade periodicals like *Musical Merchandise Review* (*MMR*), the major press organ for the American instrument trade, industry leaders celebrated growth and pondered statistics that

[2] "AMC statistics on amateur music," *Musical Merchandise Review*, April 1961, 38.

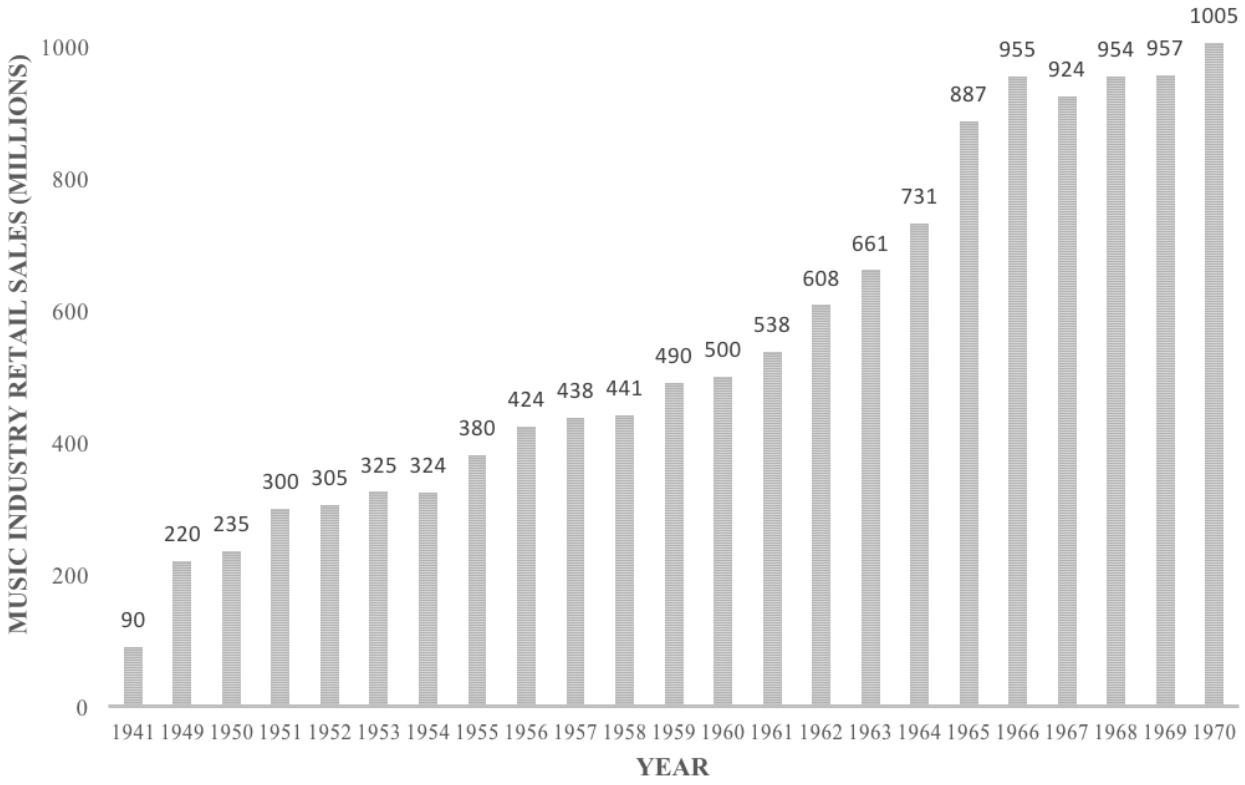

Figure 1. Music industry retail sales, 1941-1969.[3]

pointed toward a bright future, especially the sheer dollar volume of musical instrument sales. Although the immediate postwar period signaled a dramatic low point in consumption of musical instruments, the 1950s experienced continuous growth (an average of 8.63% per year), and the industry was generally encouraged about the prospects that the sixties might bring. Indeed, central to the industry's bright forecast was the prospect of reaching $1 billion in annual sales, a figure that would eventually be attained in 1970 (fig. 1).

A variety of factors contributed to this optimistic projection. First of all, the immediate postwar period witnessed a huge boom in the population of the United States. Indeed, this generation of "baby boomers" increased the population by a third between 1940 and 1960,

[3] These statistics were taken from the American Music Conference's 1972 annual report on the state of the instrument trade. See *Music USA* (Kalamazoo, MI: American Music Conference, 1972), 3.

creating both a larger potential workforce and market. Furthermore, the nation's burgeoning gross national product (GNP) signaled strong economic growth overall. The music industry took particular delight in the increasing percentage of GNP being spent as disposable income.[4] Increased spending on non-essential items was further supported by new plastic credit cards, beginning with the Diner's Club card in 1950, which helped to foster new fantasies of personal wealth. Such factors bolstered the 1950s' capacity to enable a "good life" rooted in material comforts, which strongly separated it from the depression, rationing, and austerity that characterized the preceding decades. Indeed, the credit card, which elides borrowing and spending in a single transaction, encouraged consumers to spend an average of 35% more than they would have with cash.[5] For their part, advertisers were also increasing spending to foster greater consumer desire; in 1945, less than 3 million dollars were spent annually in the United States on advertising while, by 1960, this figure reached nearly 12 million.[6]

But the most important statistic for music industry leaders was growth in the percentage of disposable income spent on musical instruments (fig. 2). And, indeed, these figures demonstrated a marked increase in the amount of discretionary income spent on instruments in the postwar period. For example, in 1941, retail sales of instruments comprised 0.111% of personal consumption. After the war, this figure rose sharply to 0.145% in 1951, and then experienced uneven growth over the course of the decade. The figure for 1961 (0.160%) met and slightly surpassed the peak level of the 1950s (0.159%, in 1956) before embarking on a precipitous rise

[4] For the period in question, between 62% and 65% of GNP spent as disposable income is typical.
[5] Eugenia Kaledin, *Daily Life in the United States, 1940-1959* (Westport, CT; London: The Greenwood Press, 2000), 127.
[6] Kaledin, *Daily Life in the United States*, 152.

Figure 2. Music instrument sales as a percentage of personal consumption, 1941-1969.

over the course of the subsequent decade to its 1965 peak of 0.206%.[7] These statistics are particularly important because they helped the instrument trade to understand its competitiveness relative to other types of goods that might vie for the disposable income of Americans. Broadly speaking, instrument purchases fell under the category of "recreation," which was witnessing the largest rise in personal consumption expenditures at this time. The music trades were not competing with the other arts necessarily but rather, as *MMR* put it, with the consumer's desire to spend their dollars "on a pleasure cruise… a second car, or [their decision] to invest in a boat."[8]

The growth sustained by the instrument industry in the postwar period was supplemented by significant changes within the realm of education during the same period. Of central importance were the cascading effects of the G.I. Bill, which prompted a general shift toward

[7] *Music USA*, 3.
[8] "The General Economy," *Musical Merchandise Review*, February 1961, 37.

white-collar work, greater income, increased leisure time, and interest in creative pursuits. The novelty of this state of affairs was neatly summarized by Todd Gitlin in his *The Sixties: Years of Hope, Days of Rage* when he wrote, "the United States was the first society in the history of the world with more college students than farmers."[9] Music education has always been of primary importance to music retailers; music stores and teachers have often worked in tandem to refer students to each other, and many retail locations maintain their own studio spaces where lessons can take place. But the surge in student populations after the war, especially at the high school level, generated a huge potential market for instruments. In 1961, for example, *MMR* reported that the American high school population had nearly doubled since 1946 (from about 6 million to just over 10 million).[10] More interesting for music retailers was the increased number of high school students who took up an instrument. While this figure was about 10% in 1946, it increased to 17% at the outset of the 1960s. Part of this growth can be attributed to music education's association with academic achievement, positive character development, and a broad humanist sentiment posited by contemporary political leaders; as John F. Kennedy's press secretary, Pierre Salinger, remarked in the forward to Stephanie Barach's *An Introduction to the Language of Music* (1962), a dictionary of musical terms, "It [music] will bring us happiness. It will bring us peace. And it will bring us a greater understanding of the artistic ties that bind all men together."[11]

The principal instrumental music ensembles supported by American schools in the 1960s were the string orchestra and the concert band. But the early 1960s also bore witness to a surge in the popularity of school-supported stage bands. While this type of group started to develop in

[9] Todd Gitlin, *The Sixties: Years of Hope, Days of Rage* (New York: Bantam Books, 1987), 21.
[10] "Musical merchandising… comes of age," *Musical Merchandise Review*, March 1961, 28.
[11] Stephanie Barach, *An Introduction to Music* (Washington, DC: Robert B. Luce, Inc., 1962), ix.

the 1920s, contemporaneously with the emergence of the big bands, it was not until the early 1960s that school populations reached a level high enough to support this institution on a large scale; in early 1963, the American Music Conference (AMC), a nonprofit concerned with researching and promoting amateur music-making, estimated that a quarter of American high schools would have a stage band by the end of the year.[12] These circumstances suggested a good market for band instruments and industry personnel encouraged dealers to work closely with band directors to develop or even start a band, if one did not already exist locally. Because this type of group not only performed but also engaged in competition, the quality of their equipment was held to be of serious import. The pathway between participation and purchase, then, was clear. As Tony Rulli, a stage band clinician with H. & A. Selmer, Inc., put it, "[student musicians] realize that a good instrument [is] almost a prerequisite to good performance in the stage band. In a lot of cases they couldn't afford them—but got them anyway!"[13] And while stage bands principally worked to bolster the sales of brass, woodwind, and percussion instruments, they also helped to support the guitar and, to some extent, the accordion—then America's second and fourth most popular instruments, respectively—which generally lacked a place in the curricula and ensembles of American schools, a point to which I will return later in this chapter.[14]

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[12] In September of 1961, *MMR* reported that there were 5,000 stage bands in operation in US high schools. See "Instrument and accessory sales are on the (Stage) Bandwagon," *Musical Merchandise Review*, September 1961, 33. In March of 1963, the AMC reported that 6,000 stage bands had been formed within the last decade. See "Are dealers taking advantage of—THE NEW SWING IN HIGH SCHOOL MUSIC?", *Musical Merchandise Review*, March 1963, 32.

[13] "Instrument and accessory sales are on the (Stage) Bandwagon."

[14] For more on the problems encountered in applying to college music programs as an accordionist in the early 1960s, see Donald Hulme, "In acceptance lies the future of the accordion," *Musical Merchandise Review*, October 1962, 30. The crux of Hulme's critique is as follows: "These advanced students, nevertheless, are greatly disappointed and hurt to find that they are refused entrance to many colleges of their choice, not at all by their general qualities of musicianship, but solely because this particular instrument is not yet a generally accepted major instrument."

While school music programs fared well throughout the 1960s and comprised one of the instrument trade's central markets, dealers also focused their efforts on fostering domestic, family-oriented music-making, as generous government subsidies encouraged many new consumers to enter the housing market after the war. Although the 1930s witnessed a large effort on the part of the United States government to stimulate growth in the then-collapsing housing industry, especially through the establishment of the Federal Housing Administration (FHA), these efforts came to their greatest fruition after the war with the GI Bill and its provision for the establishment of the Veterans Administration (VA). Through their joint effort, the FHA and VA worked to provide beneficial financial terms to encourage the construction and purchase of new homes in the United States, including mortgage insurance, extended repayment schemes, lower interest rates for home loans, and regulations governing minimum construction standards.[15] And, as the suburbs swelled, a distinctive kind of culture coalesced alongside it. In their introduction to *Changing Suburbs*, Richard Harris and Peter J. Larkham describe the emergence of "a private culture," marked by its "[focus] upon domesticity and family pursuits, reinforced by home ownership, and increasingly associated with mass consumption."[16]

These factors were not lost on music merchants as they considered how best to pitch their instruments against other leisure-time pursuits that might compete for a suburban family's disposable income. In their end-of-year message, printed in the December 1961 issue of *MMR*, the National Association of Accordion Wholesalers (NAAW) noted, "Today's family wants to

[15] For a more in-depth discussion of federal initiatives to stimulate construction and homeownership in the first half of the twentieth century, see Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York; Oxford: Oxford University Press, 1985), especially chapter eleven. Although these terms were beneficial for many American families, the FHA's housing policies demonstrated racial biases that restricted many African-American families from taking advantage of them. For more on this topic, see Richard Rothstein, *The Color of Law: A Forgotten History of How Our Government Segregated America* (New York; London: Liveright Publishing Corporation, 2017).

[16] Richard Harris and Peter J. Larkham, "Suburban Foundation, Form and Function," in *Changing Suburbs: Foundation, Form and Function*, ed. Richard Harris and Peter J. Larkham (London: E & FN Upon, 1999), 15.

do things together, wants to improve itself culturally and socially, wants to have fun, wants to enjoy its pleasures indoors or outdoors, wherever it goes the year 'round, and demands that it get all these benefits quickly and easily." For the NAAW the accordion—easy to learn and capable of "[providing] the instrumental backing for a family songfest," indoors or out—was the ideal product to satisfy this new type of consuming entity.[17] This reconceptualization of the family as the principal consumer of musical instruments (rather than a single individual) also led dealers to become increasingly focused on large, "family" purchases. Indeed, this shift in consumer perception was crucial for bringing expensive instruments like the electronic organ, which was then widely regarded within the trade as a "rich man's toy," within the reach of purchasers who could not have afforded one previously.[18]

Taken together, then, the postwar period presented a variety of social and economic circumstances that created a strong potential for growth in the musical instrument trade. Nonetheless, manufacturers and retailers remained cognizant that the capacity for instruments to be expressive of certain values and lifestyles nonetheless needed to be asserted and reinforced by promotional efforts. In June of 1963, *MMR* published a lengthy piece reflecting on the changes undergone by the American instrument trade since the beginning of the twentieth century; alongside many of the social and economic circumstances already outlined here, *MMR* focused on efforts that had been made to rehabilitate American social perceptions of individuals who played instruments, whether for recreational or professional purposes. Most strikingly, they described associations between musicality and abnormality: "Playing an instrument has come more and more to be associated with 'sissies' and strange people who, the thought was, turned to

[17] "NAAW," *Musical Merchandise Review*, December 1961, 36.
[18] Tony Habig, "The organ market," *Musical Merchandise Review*, March 1961, 38.

music because they weren't successful in the real lively aspects of life and lacked popularity."[19] This concerted attempt to rehabilitate and normalize musical performance speaks to Philip Brett's critique of the long-standing association between "musicality" and perceived "deviance," especially homosexuality: "tools of social control dressed up in one case as 'talent,' in the other as 'condition.'"[20] While the industry as a whole perceived such "deviance" as a commercial barrier and worked to counter it, it was the AMC—functioning as the trade's de facto propaganda wing—who worked most assiduously to shift public perceptions of amateur music-making and, therefore, to foster the public's desire for its benefits.

But while playing music has many potential advantages, not all of them contributed to the public perception that the AMC wished to inculcate. For example, while new approaches to music therapy were being developed throughout the 1950s and 60s by people like Paul Nordoff and Clive Robbins, the AMC was cautious to avoid mentioning these activities for fear that "the effect would be to associate playing of instruments with people who have things wrong with them—one of the things that was wrong in the first place."[21] Rather, the AMC worked throughout 1962 and 1963 to circulate articles in major general interest magazines (e.g. *Time*, *House Beautiful*, and *Newsweek*) touting the developmental and recreational benefits of playing an instrument. Given the US's expanding postwar student population, the belief that playing a musical instrument was beneficial for children was frequently mentioned. The AMC's 1961 report, for example, mentions the importance of music for stimulating academic achievement, social engagement, and character development.[22] Furthermore, as the adult market for music

[19] "The musical instrument industry in perspective: Where have we been? Where are we going?", *Musical Merchandise Review*, July 1963, 16.
[20] Philip Brett, "Musicality, Essentialism, and the Closet," in *Queering the Pitch*, ed. Philip Brett, Elizabeth Wood, and Gary C. Thomas (New York; London; Routledge, 2006), 22.
[21] "The musical instrument industry in perspective," 17.
[22] "AMC statistics on amateur music."

instruments continued to expand in the early 1960s, the AMC highlighted the joys available to adults who might be interested in engaging with an instrument during their expanding leisure time. One such piece was *Time*'s "The Sound of Music," which spoke of Atlanta's Sorta 40, a dance band comprised of "a dozen prominent (and fiftyish) business and professional men" who play for fun, donating the proceeds from their performances to charity. The article also mentions another group called The Seventeen, which included amongst its ranks "three architects, a doctor, an investment counselor, the plant manager for a box factory, an engineer, a lumber company vice president and an adman."[23] By highlighting both the high professional status of these amateur musicians, as well as their charitable nature, the AMC worked to temper musicality's association with deviance. Indeed, their efforts re-articulated musical practice as something that the middle and upper classes could engage in for the benefit of those at the margins of society.

1.2: Electronics Against Individuality

While the AMC worked to promote amateur music-making in general, the instrument trade—which was comprised of a number of organizations representing the interests of a single instrument or category of instruments—continued to debate the relative merits of its various wares. Indeed, one of the principal functions of trade periodicals like *MMR* and its British counterpart, *Music Trades Review* (*MTR*), was to help instrument dealers make decisions about which instruments they should stock, and editorials written by industry leaders worked to shape these merchants' perceptions of what the public wanted. Without a doubt, throughout most of the postwar period, the piano enjoyed the most privileged position; as Frank O. Wilking of the

[23] "The Sound of Music," *Time*, March 29, 1963, 89.

Indianapolis-based Wilking Music Co. put it memorably in early 1961, "without doubt… the public still uses and accepts the piano as the basic musical instrument."[24] This special status was borne out and reinscribed by these periodicals' intense focus on keyboard instruments in general, especially the electronic organ and the accordion, over and above brass and woodwind instruments, stringed instruments, and the guitar. But, even within this keyboard cadre, important divisions emerged concerning new technological developments in manufacturing processes and, especially, the application of electrical components in instrument design.

Prior to the rise of larger-than-life electrical amplification, which I will discuss shortly, the primary affordance of electricity with regard to instrument design was the possibility of distributing sound-generating functions from the performer to the instrument. (For an acoustic instrument, the responsibility for tone generation is entirely that of the performer.) One of the signature applications of electronic technologies in instrument design at this time was, then, making instruments easier to play. While the youth had time to invest in practicing and developing sufficient technique on an instrument over a period of years, the instrument trade's efforts to court an older audience (made more commercially appealing by virtue of their increasing life expectancy) centered around instruments that could be played instantly. Chief among these was the electronic organ.[25] In an *MMR* feature from March 1961, the magazine

[24] "Statements by industry leaders," *Musical Merchandise Review*, February 1961, 42.

[25] Another new technology in this vein was the ElectraChord. Invented by Lee Von Guten in the mid-1950s and produced by Woods and Brooks Co. of Buffalo, NY in the early 1960s, this electro-magnetic device, when attached to a standard piano, allowed the pianist to play whole chords at the push of a single button, similar to a chord organ. The ElectraChord also enabled pianists to play large intervals in the left hand that might have otherwise been out of their reach. In an article on the invention printed in the May 1961 issue of *MMR*, the president of Woods and Brooks Co., Charles H. Wood II, predicted that the ElectraChord would help to double piano sales over a period of a few years. See "Invention of ElectraChord May Revolutionize Industry," *Musical Merchandise Review*, May 1961, 34, 69. The invention, however, was not greeted with equal enthusiasm throughout the trade. As Joanne Knoch quipped in her report on the 1961 NAMM convention for the *Chicago City Tribune*: "I don't want to shed gloom on the prospects for your continued career as a piano teacher, but these people over at the music industry trade show in the Palmer house seem determined to do the work for you. 'Instant piano,' they're calling it…. Take chords, for instance—how are you going to keep pupils happy learning them after they have seen pushbuttons do the same thing?" Joanne Knoch, "'Instant Piano' Debuts at Music Show Here," *Chicago Daily Tribune*, July 18, 1961, B5.

touted that "the electronic organ is a medium of musical self-expression that requires minimum formal music training."[26] This easy-to-play aspect of the instrument—enhanced by features such as Lowrey's Automatic Orchestra Control (AOC), as well as the burgeoning field of built-in rhythm accompaniment—enamored the organ with older consumers. While 85% of band instruments and 65% of pianos were purchased for use by school-aged children in 1960, 70% of organs were purchased by people between the ages of 30 and 50.[27] The gentle learning curve of these instruments was perhaps best encapsulated by a pitch used by Lowrey to sell its new AOC-ready organs. In an advertisement from 1963 featuring a young woman, the firm asks: "Aren't most of your prospects budding 'one-finger artists'?" (fig. 3).

If school music ensembles and a spate of newly formed, casual bands of professionals provided children and working men, respectively, with an occasion for self-expression, it left open the matter of what role music might serve in the lives of more socially isolated individuals, including the elderly and the archetypal suburban woman: the housewife. While the women of suburbia were overwhelmingly denied opportunities to pursue musical performance professionally, they were nonetheless courted by some instrument dealers as a potential market for their wares, which were positioned as a kind of consolation prize for the "problem that has no name" outlined by Betty Friedan in 1963.[28] Tony Habig of W. W. Kimball outlined the pitch for the electronic organ:

[26] Habig, "The organ market."
[27] "AMC statistics on amateur music."
[28] Betty Friedan, "The Problem That Has No Name," in *The Feminine Mystique*, 15-32 (New York: W. W. Norton & Company, Inc., 1963).

Figure 3. Lowrey Organ advertisement featuring Automatic Orchestra Control (AOC), 1963.

> Although times have changed considerably for the better, and our women-folk today are busy with a variety of duties, both at home and for their communities, we rarely think of them as being lonely, but there is still a need for home entertainment, and for many who have not had formal musical training, the electronic organ can replace the reed organ of former days.[29]

The democratic potential of new technologies like Lowrey's AOC thus suggested a dramatic reimagining of the electronic organ as an instrument for the immediate satisfaction of amateurs

[29] Habig, "The organ market," 62.

with adequate finances, whatever their age or gender. In an *MMR* editorial from October 1963, the periodical reflected, "It's a dull modern indeed who can't make music with one of these exceptional instruments." But, despite the instrument's growing commercial prospects and its close alignment with the objectives of the AMC, the application of electrical technologies in the service of making instruments easier to play was not universally valued by the trade. Rather, some of its more conservative figures viewed the application of electronic technologies as distorting the fundamental nature of music as a practice. The aforementioned *MMR* editorial continues, articulating a position that is worth quoting at length:

> Science—of which electronics is a part—has done much to facilitate the growth of the entire musical instrument industry…. Science is our friend—but it can also be our enemy. It is a broad condition of life that science and the arts remain separated…. We speak of achievements being made in the scientific or art sphere; and people are classified as suited to scientific or artistic pursuits. Wherever men market products this separation must be taken into account. In the musical instrument industry we market products that enable people to be artists.… Our appeal is to the artistic temperament… not the scientific. Fortunately, this temperament is common and where it's missing we've often been able to create it because we can offer a practical challenge of musicianship—one that most can successfully meet. But what happens if we take away this challenge by automating our instruments so they virtually play themselves? By utilizing scientific gadgets, gee-gaws, and grim cracks that are unnecessarily functional? In other words, what happens when we apply too much science to our art form? … We haven't pushed the science button yet! It's still our servant, not a master. And it will remain that way as

> long as we remember that we have to offer challenge and achievement with our products if we are to expand our ever-blossoming markets.[30]

The anxiety at the center of *MMR*'s editorial is automation. As the magazine notes, automation has played a critical role in reducing the costs associated with instrument production.[31] Nonetheless, the application of these technologies and techniques needed to be tightly managed, lest the craft of musical instruments move too far from the artisanal to the industrialized.[32] Furthermore, if these techniques were to move beyond the production of instruments and come to feature in the functioning of instruments themselves, then the essential nature of musical practice would be thrown into question. Instruments that "virtually play themselves" were a curiosity in other press discourses in the early 1960s but, given the instrument trade's integral commercial ties to the school and music education more broadly, it's clear that the prospect of easy-to-play instruments presented a real threat to the structure of the business. To sell "an art form and the benefits thereof," including "challenge and achievement," meant appealing to the prospective buyer's desire for personal expression. And, indeed, this

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[30] "Editorial," *Musical Merchandise Review*, October 1963, 7.

[31] An important subject in the debate concerning the relationship between instrument craft and automation were new facilities opened by Harmony in 1962 and Kay in 1964. See, for example, Joanne Knoch, "Kay Musical Swings Modern," *Chicago Tribune*, June 28, 1964, D1.

[32] Although the American instrument trade was not entirely dismissive of modern manufacturing techniques, the craftsmanship demonstrated by certain instrument manufacturers, especially foreign companies, was routinely lauded. An *MMR* piece focused on the manufacture of accordions highlights the special skills possessed by the workforce in Italy's Ancona province, the West's major supplier of the instrument: "A major reason for Ancona's dominance in accordion-making is the presence there of an abundance of skilled accordion craftsmen. While Italy's accordion manufacturers have adopted many modern manufacturing techniques and have erected large, well-equipped modern facilities, much hand craftsmanship is still required to produce fine quality Italian accordions.… The finest reeds, used in the best professional accordions, are custom made by a few highly skilled artisans of Castelfidardo who are the aristocracy of Ancona's accordion industry." See "Accordion Manufacturing is a Precision Job," *Musical Merchandise Review*, October 1961, 38-39, 96-97. In 1967 *Billboard* also noted that one of the strengths of the West German instrument trade was its continual focus on handmade products, including lyres produced in the Lother Gaertner factory "straight out of antiquity." See "$78 Million West German Musical Instrument Export," *Billboard*, September 16, 1967, 16.

affordance assumed mounting importance against the very same social and economic circumstances that enabled more people to buy instruments in the first place: an efficient, corporatized—if alienating—workplace that provided good wages and leisure time, and inexpensive goods to fill that time.[33] As the AMC put it, "as the pace of living speeds up, people turn toward participative activities, especially in the arts, as a means of releasing tensions, satisfying creative energies and establishing individual identification."[34]

As the principal site of American life shifted toward the suburban sprawl of the postwar years, this environment's perceived blandness and homogeneity became an increasingly worrisome threat to such "individual identification." Indeed, the stark realities depicted by contemporaneous texts like Sloan Wilson's *The Man in the Grey Flannel Suit* (1955) and William H. Whyte's *The Organization Man* (1956) depicted postwar American life as being dominated by conformity and obedience to larger organizations, especially businesses and communities. Suburban dwellers were here portrayed as mindless, conservative, and interchangeable—terms that were redolent of the automated and routinized production processes that characterized their working lives.[35] Little surprise, then, that suburban dwellers were deeply concerned with issues of taste distinction and individuation. Correspondingly, the leisure

[33] My use of the term "alienating" here is made with reference to the Marxist manner in which the term is used by Theodor Adorno and Max Horkheimer, especially in their critique of the culture industry in *Dialectic of Enlightenment*. While musical instruments can provide a powerful means for self-individuation and deep personal fulfilment for many people, it is equally important to pay heed to the processes by which they become implicated in political and economic ideologies that position consumption as a viable strategy for overcoming the alienation inherent in industrialized labor. I broach this idea later in this chapter with a discussion of dream merchandising and address Adorno's critiques of mass culture in greater detail in chapter three. See Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment*: *Philosophical Fragments*, ed. Gunzelin Schmid Noerr, trans. Edmund Jephcott (Stanford, CA: Stanford University Press, 2002), especially "The Culture Industry: Enlightenment as Mass Deception," 94-136.

[34] "AMC statistics on amateur music."

[35] This characterization of individuals as homogenous and indistinct can be read against the proliferation of Fordist production techniques throughout the twentieth century. In her survey of postwar American culture, Eugenia Kaledin notes that the techniques of mass production, as applied to the construction of homes, flattened the regional difference of domestic architecture in the United States. The proliferation of "ranch" style homes in new environments, such as New England, is emblematic. See Kaledin, *Daily Life in the United States*.

activities of suburban America shifted markedly toward "legitimate" culture, such as classical music and literature. Indeed, in the 1950s Americans spent more money on tickets to classical music concerts than baseball games, and more on records and hi-fi equipment than spectator sports.[36] The decade also witnessed the publication of Mortimer Adler and Robert Hutchins' *Great Books of the Western World*, an important literary anthology released under the banner of the Encyclopedia Britannica. And, as these entrenched cultural institutions propagated and promoted "great" works en masse, the popular critical writings of Lewis Mumford, Jane Jacobs, John Keats, Russell Lynes, and many others encouraged Americans to simultaneously question their worlds, their tastes, and their judgments. If the prospect of a flat, blank suburbia loomed throughout the postwar period, it was regularly counterbalanced by an assertion of—or at least a quest for—individuality in art. Perhaps no contemporary genre exemplified this better than literary fiction, with characters like J. D. Salinger's Holden Caulfield or Jack Kerouac's Sal Paradise. As Eugenia Kaledin writes in her survey of 1950s literary trends, "Finding out who you were remained one of the exciting mind-games of the '50s, a period where complexity was cherished."[37] And, as Richard Hofstadter put it in his *Anti-Intellectualism in American Life* (1963), all of these cultural pursuits could be framed against a deep and persistent anxiety about the value of American culture on the world stage: "For all their bragging and their hypersensitivity, Americans are, if not the most self-critical, at least the most anxiously self-conscious people in the world, forever concerned about the inadequacy of something or other—their national morality, their national culture, their national purpose."[38]

[36] Kaledin, *Daily Life in the United States,* 127.
[37] Kaledin, *Daily Life in the United States*, 159.
[38] Richard Hofstadter, *Anti-Intellectualism in American Life* (New York: Alfred A. Knopf, 1963), vii.

Against this twin desire for cultural respectability and individuality, musical performance took on a new importance for suburban families. On the one hand, music provided a pathway to cultural legitimacy. This was especially true in school music programs, which encouraged participation in orchestras and concert bands. In addition, the active nature of musical performance was understood by some to constitute an antidote to the passivity fostered by the precipitous rise in consumption of television sets and programming witnessed throughout the previous decade and their increasing centrality in American identity and experience. Indeed, American ownership of television sets swelled throughout the 1950s, from about 19 million in 1952 to 32 million in 1960, as American life became increasingly oriented around the device.[39] Already by 1956, Americans were spending more time watching television than working for pay. By 1963, the A. C. Nielsen polling firm reported that American televisions were turned on for an average of nearly six hours per day. This growth fueled parental anxieties about their children's development, as exemplified by this *MMR* editorial from March 1961:

> Parents [are] becoming anxious over the development of lethargic habits in their children, by continually watching television… [and are beginning] to stimulate and prompt the children to participate in activities on their own.… [In order to counteract these bad habits] interest was stimulated not only in music, but in playing an instrument, learning how to play a piano, or otherwise taking part in the process of music-making.[40]

[39] Kaledin, *Daily Life in the United States*, 133 and 146.
[40] "Musical merchandising… comes of age," 29.

These observations corroborate the role played by mass media in James S. Coleman's *The Adolescent Society*, a sociology of American high schools researched in the latter half of the 1950s and published in 1961. In Coleman's estimation, mass media functioned principally as an escape for students who were denied status, whether by virtue of their low athletic or academic achievements, or because of a lack of educational capital amongst their family members: "When he [the student] is in a system that fails to give him status and allow him a positive self-evaluation, the adolescent often escapes to a world where he need not have such a negative self-evaluation: the world of mass media."[41] Music, then, could function as an opportunity for children to achieve some kind of status in their school community, and to engage socially with others.[42]

The experience of watching television, then, functioned as a foil against which the potential benefits of music-making could be positioned. But instrumental performance was also a feature of televisual programming and, therefore, the television also played its own role in shaping attitudes toward musical instruments. Although the instruments of the orchestra and band had an established cultural life prior to the advent of television, for many viewers the guitar—especially through its being featured in rock 'n' roll—was inextricably associated with televisual popular culture and certain of its negative attendant values (e.g. low-brow, anti-individualistic). If cultural uplift, self-satisfaction, and community were the principal values to

[41] James S. Coleman, *The Adolescent Society: The Social Life of the Teenager and its Impact on Education* (New York: The Free Press; London: Collier-MacMillan Ltd., 1961), 243.

[42] It should be noted that Coleman observes gendered differences in terms of how status (i.e. popularity) is accrued by high school students. For boys, status is overwhelming correlated with participation in athletic activities, specifically, while for girls it is correlated with participation in activities in general. Coleman also suggests that over-investment in any single activity is typically a marker of outsider status. For example, while many students enjoy current popular music, they do not necessarily claim to be up on current trends. Indeed, deep interest in popular music could be understood to function as a substitution for social interaction amongst the lowest status segment of a student population. Correspondingly, while participation in a school music ensemble would likely furnish a modest net benefit for a student's status among their peers, over-investment in such work might lead toward the ostracized "band geek" stereotype parodied by films like *American Pie*.

be fostered by musical performance, the guitar was nonetheless understood within the discursive space inhabited by the instrument trade to be incapable of inculcating the same.

For their part, guitar manufacturers were keen to reframe the value of the guitar according to terms that would benefit from the free promotion presented by television, rather than be hampered by it. Sidney Katz of Kay Guitars, for example, sought to re-categorize the instrument: "To capitalize on this promotion [television] dealers should attempt to get the guitar out of the band and orchestra category and out of the studio operation. Promote it as a recreational instrument… you are selling fun, pleasure and popularity as well as 'easy-to-play.'"[43] But within the keyboard-centric pages of *MMR*, Katz was often a lone voice speaking on behalf of the commercial viability of the guitar. Although *MMR*'s editorials recognized the instrument's impressive sales figures, boosted significantly by rock 'n' roll and the folk revival, the guitar was nonetheless viewed overwhelmingly as a passing fad.[44] The culmination of the trade's lackadaisical attitude toward the instrument was the publication of an October 1963 article with a telling title: "After guitars—what?" In it, the anonymous author reported that many dealers and industry personnel were skeptical about the instrument and felt that the accordion would likely take its place as the next big thing.[45] This piece was met with a rebuttal from Katz, who argued

[43] "Guitar selling," *Musical Merchandise Review*, May 1961.

[44] Several pieces published in *MMR* in the early 1960s draw attention to the guitar's rapidly increasing popularity. A report on the opening of a new factory for the Harmony company in 1962, for example, remarked that "the guitar claims the title of America's most popular musical instrument." "New Home for Harmony," *Musical Merchandise Review*, May 1962, 81, 84. The AMC reported in the following issue of *MMR* that the guitar was being taken up by five million amateur musicians, which put it in second place behind the piano's twenty-one million. In third place came the organ, with 2.6 million amateur players. Curiously, the AMC published statistics solely on the growth in piano and organ sales over the preceding ten years, despite the guitar being played by twice as many people as the organ. On the one hand, this discrepancy could be attributed to the higher dollar value of organ sales compared to most guitar sales, as the vast majority of guitars sold during this period were typically in a low-price range. On the other hand, it speaks to the industry's general lack of faith in the long-term prospects of the guitar. See "Report on Amateur Music in the United States," *Musical Merchandise Review*, June 1962, 154-55, 190. Just over a year later, in August of 1963, the magazine would admit that the guitar was the number one instrument in terms of unit sales, which "have been increasing in popularity and faster than the general rise in interest for all musical instruments." Roland L. Minda, "Profile of a Guitar," *Musical Merchandise Review*, August 1963, 46.

[45] "After guitars—what?", *Musical Merchandise Review*, October 1963, 38-39.

that treatment of the guitar as a passing fad was a self-fulfilling prophecy carried out by a trade that was ignoring years of clear signs in American popular culture:

> Oh, the guitar boom could BE a fad, could possibly "run out" in a few years… but ONLY if the music dealers and the music press want to make it so. If they are serious enough, thoughtful enough, to consider the reasons WHY guitar and folk music have become so popular, they will soon realize that this is indeed NO fad.[46]

As I explain in greater detail shortly, the trade would ultimately be shocked into acknowledging the well-established popularity of the guitar during the British Invasion. But, as Katz attests, the guitar had been slowly building steam for many years beforehand through its presence in a variety of popular genres, including rock 'n' roll, country, and folk. And, for their part, teenagers had been eager to embrace the instrument. A 1963 survey carried out by the UK's Schools' Music Association (SMA) determined that boys—though also, to some extent, older girls—overwhelmingly favored the guitar as the instrument they would most like to play.[47] And, in its own coverage of the survey, *Music Trades Review* (*MTR*) singled out the role of the television in fostering this preference: "The Report shows very clearly that the T.V. has greatly influenced the choice of instruments, and that the 'pop' singer who plays or maybe holds a guitar and the dance band are making quite a deeply-etched impression on young people."[48] *MTR*'s low esteem for popular music is palpable here and, like the American music trade, its disdain for

[46] Sidney M. Katz, "After '63-What?... and where does the guitar business go from here?", *Musical Merchandise Review*, November 1963, 48, 76.
[47] In the SMA's survey, most young girls demonstrated inclination toward the piano. In secondary grammar schools, however, they tended to prefer woodwind instruments. Girls enrolled in secondary modern schools demonstrated the greatest preference for guitars overall (29%). "Musical merchandise page," *Music Trades Review*, March 1963, 102.
[48] "Musical merchandise page."

popular music and its instrumentarium often put it awkwardly at odds with important commercial trends, especially those fostered by young people. Part of the problem was rooted in music merchants' lack of expertise and, correspondingly, a sense that they could not affect popular trends by flexing their salesmanship. For example, with regard to the sale of records, which many "music-radio" merchants stocked, *MTR*'s editor admitted, "So far as the popular end is concerned, there's not a great deal that you can do. But you can see to it that your stock shelves are ready to cope with demand, as you pray that the fan clubs and their followers will throw up a steady supply of winners."[49] The agency in securing the sale is shifted here from the music merchant to the consensus of the fan club; while the dealer can reap a profit in selling the coveted item, they cannot hope to understand how to foretell such desires. This state of affairs mapped neatly onto the sale of instruments as well, especially that of the guitar. As the instrument began to receive increasing coverage in the UK toward the late summer of 1963 (especially around the annual British Musical Instrument Trade Fair) the industry began to reconsider the instrument, and how best to capitalize on it. In a piece from their August trade fair supplement with the telling title of "Get with it—with guitars," *MTR*'s R. Sadleir decreed, "Every retailer should have a teen-age guitar salesman—a youngster who thinks the same way as the customers. It is virtually impossible for a mature business man to face the Saturday afternoon horde of teen-agers who jangle away for hours on end."[50]

Had the American instrument trade heeded Sadleir's advice, it's likely that they would have been better prepared for a sudden shift in the commercial prospects of 1964. In March of that year, the National Association of Music Merchants (NAMM) held a regional meeting in

[49] "Sticking to one's last," *Music Trades Review*, July 1963, 316.
[50] R. Sadleir, "Get with it—with guitars," *Music Trades Review* (trade fair supplement), August 1963, 22.

Atlanta to discuss a pressing issue then facing the American music trades. In their coverage of the event, *MMR* penned an ambiguous lament: "It was disheartening to see grown men cry; particularly when they didn't know whether they should be tears of joy or sorrow."[51] The problem? Music retailers didn't have enough guitars in stock to meet the unprecedented demand for the instrument sparked by the Beatles' February 9 performance on the Ed Sullivan show. Indeed, the Beatles' performance showcased a full range of electric guitars to an enormous audience of 73 million people. Furthermore, although it was common practice to obscure branding on pianos used for televised performances, the unique shapes and branded headstocks of the Beatles' guitars were easily visible.[52]

In addition, the unique circumstances of their reception sparked a practical need for louder amplification. Previously, the purpose of a guitar amplifier had been to put the quiet instrument on an equal footing with louder acoustic instruments, such as the brass and woodwinds of a dance band. This allowed the instrument to be used in a new, soloistic manner—as in the work of early electric guitarists like Charlie Christian—rather than as an accompanying rhythm instrument.[53] In the Beatles' performances, however, the instruments' amplifiers now needed to exceed the volume produced by their screaming fans, which had no musical correlate. And while the Beatles' performances became marked chiefly by their volume, their fans were louder. As the *Boston Globe* reported after the group's February 12 performance at Carnegie Hall:

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[51] "Editorial," *Musical Merchandise Review*, April 1964, 5.

[52] In March 1966, a reader wrote in to *MTR* expressing dismay at this practice: "It is now the accepted practice to remove manufacturers' names from pianos before they are used in television programs to prevent any degree of advertising or publicity. Yet there is a growing trend towards guitars, amplifiers and drums having trade names boldly visible, though in some instruments the design is, in itself, enough identification. Perhaps the P.P.A. would be interested in making a note of this—it appears to me to be unfair discrimination against one section of the industry, or are the manufacturers concerned too small in number to voice an effective grievance?" See "Keyboard Notes," *Music Trades Review*, March 1966, 80.

[53] For more on this development in amplified guitar technique, see Steve Waksman, *Instruments of Desire* (Cambridge, MA; London: Harvard University Press, 1999), especially chapter one.

> When the Beatles came onstage… the screaming was literally deafening. There were some moments when you could hear the beat of the Beatles' music, the drums being pounded and the electric guitars turned up to their loudest. Occasionally you caught a word or two of the singing. But only someone with a knowledge of Beatle records could have any idea what 'tunes' were being played.[54]

Indeed, even William Mann, in his now-famous early *Times* piece on the group, tempered his celebration of "pan-diatonic clusters" and "flat—submediant key—switches" with a barb for their loud, electronic sound: "I suppose it is the sheer loudness of the music that appealed to Beatles admirers… and many parents must have cursed the electric guitar's amplification this Christmas."[55] The appeal of this loud sound was difficult for the adult world to grasp, and cultural critics like the *New York Times*' David Dempsey explained its appeal as an expression of teenagers' desire to cede their free will and conform to the mandates of their authoritarian idols.[56] The electrical instruments that afforded these experiences, then, worked to further entrench the generational divide sundering popular music audiences that began in earnest with rock 'n' roll.

In many respects, the story so far is a tale of unintended consequences, of unruly contingencies in the instrument marketplace beginning to wrest control from the industry leaders who had structured its interrelationships and modes of exchange thus far. Capitalist exchange exists between two parties—buyers and sellers—but, as the preceding makes clear, the features exhibited by both and the nature of their relationship are strongly determined by their

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[54] Henrietta Leith, "Beatles Lift Roof at Carnegie," *Boston Globe*, February 13, 1964, 32.
[55] William Mann, "What Songs the Beatles Sang…", *The Times* (London), December 23, 1963, 4.
[56] See David Dempsey, "Why the girls scream, weep, flip," *New York Times*, February 23, 1964, SM15.

connections with other kinds entities including media (television), the culture industry (popular musicians), government administrations (the FHA and VA), social formations (the suburbs), new instrument technologies (electric guitars and amplifiers), and no doubt many others. Indeed, our grasp of this sea change in the instrument trade would benefit from attending to the industry as a large social assemblage comprised of a huge range of components whose effects—as we have seen here—cannot always be foretold. The emergent focus on "sheer loudness" attests to the way in which a change in the capacities of one assemblage (the increasingly amplified electric guitar) can cascade through those in which it is nested: through the bands that play these instruments to the audiences that hear and see them, whether live or on television; to the journalistic institutions that sensationalize the novelty of these performances; to the musical instrument trade, whose allegiances with other musical styles and technologies inflect its bristling at the prospect of supporting this work; to the amateur musicians who, for a host of reasons, might wish to emulate the musicians at the forefront of this major shift in popular culture. The second half of this chapter will begin to sketch out some of the ramifications posed by this electrical instrumentation with respect to the structure and composition of both the instrument trade and its consumer base. Indeed, as I will show, electricity came to profoundly mark the separateness of youth music.

1.3: Selling High-Voltage Sounds

In the summer of 1965, the Pulitzer Prize-winning author James A. Michener received an unusual invitation from his neighbor, St. John Terrell, the proprietor of a Lambertville, NJ theater called the Music Circus. Alongside producer Phil Spector, radio host Bruce "Cousin Brucey" Morrow, and cartoonist Harry Haenigsen, Michener would soon find himself tasked with judging a crop of no less than eighty-eight teenage combos in a national rock 'n' roll

"championship" being held at Terrell's theater. While Michener, then in his late fifties, openly admitted his outsider status with regard to this burgeoning culture of teenage music-making, he nonetheless found it fascinating. In a *New York Times* article published in October of that year, he reflected especially fondly upon what he perceived to be the pronounced determination and professionalism of these young musicians. But he was also struck by the barrage of new, electrified music technologies supporting their production of the "new sound":

> The musical instrument... itself seems to be less important than the electronic systems that reproduce it and throw it full volume at the listener. If... the electricity happens to go off, the music of this generation subsides into a meaningless whisper.[57]

Nor was Michener alone in his assessment. Just two hours by car to the east, in Long Island, *Newsday* critic Bob Micklin was taking note of the sudden profusion of youthful combos, all "featuring the high-voltage sounds of electric guitars, electric basses, electric amplifiers, electric organs, electric 'fuzz tones' and electric speakers. Even their names pulsate with an electric tone."[58]

Michener and Micklin's characterizations of this rapidly expanding milieu tapped into what was then, no doubt, a palpable association between electrical instruments and youth culture. If the music of the urban folk revival, characterized by its acoustic timbral palette, was the domain of a serious-minded, principally college-aged audience, then the loud, electrically augmented pulse of the "big beat" was endemic to a younger set of fun- and thrill-seeking teens.

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[57] James A. Michener, "One Near-Square Who Doesn't Knock the Rock," *New York Times*, October 31, 1965, SM56.
[58] Bob Micklin, "Those Crazy Combos Rock the Island," *Newsday*, October 29, 1965, 3C.

Catapulted into the cultural mainstream by prominent groups like the Beatles and the Rolling Stones, these objects—chief among them the electric guitar—were viewed variously as modern, youthful, and even dangerous.[59] The guitars, basses, and organs used by the "beat" groups were the first electrical instruments to achieve widespread popularity and commercial success and, in the technophilic, progressivist language characteristic of the early 1960s, were often valorized as a modernizing force ushering in "music of the space age."[60] While such views were not universally shared, especially amongst establishment figures of an older generation—Andres Segovia, for example, once described the electric guitar as "an abomination"—their denouncements only served to further affirm the power of these instruments to separate musical cultures along generational lines.[61] Indeed, by virtue of its electrical nature, this new instrumentarium allowed young musicians to thematize volume in a new way, further

[59] Throughout the early 1960s, electric instruments—especially the electric guitar—took part in a cultural matrix centered around fears of cultural degeneracy. Along with long hair and tight-fitting clothing, electrical instruments functioned as a symbol of a new youth culture whose recreational activities challenged traditional social mores. Japan, for example, was witness to a spate of paranoia concerning *ereki* (electric guitar) concerts. While the instrument itself was not viewed as amoral, it was closely associated with lascivious dancing and abuse of sleep medications. See, for example, Robert Trumbull, "Electric Guitar of Japanese Youth Strike Sour Note," *New York Times*, October 24, 1965, 13; and "Bans on 'Ereki' Concerts Cancel 16 Japan Gigs of Beach Boys, Ast'nauts," *Variety*, December 29, 1965, 41-42. In a *Billboard* article from November 1966 focused on traditional musical cultures in Mexico, critic Kevin M. Kelleghan made the connection between electrical instrumentation and cultural degeneracy rather explicit: "Electronics may shatter a romantic Mexican tradition, the serenade.… There was a time when a young man would visit his girl's home in the early hours of the morning with a Spanish-guitar-playing trio. They'd sing love songs under her window, while the boy stared in vain at the closed curtains.… Today the girl friend is likely to be found in a rock music cafe, jerking with her boy friend to the music of a go-go electronic trio." See Kevin M. Kelleghan, "Electric Guitars Shattering Mexico's Traditional Sounds," *Billboard*, November 26, 1966, 42, 47. The electric guitar, too, was also understood to be able to explicitly cause harm via electric shock; a small number of electric guitar-related injuries and deaths were reported throughout the decade. See, for example, "Hot Guitar," *The Guardian*, November 21, 1963, 1; and "Electric Guitar Blamed in Pop Singer's Death," *The Hartford Courant*, August 21, 1968, 13.

[60] In a piece for the *Christian Science Monitor* addressing the popularity and novel construction of electric guitars, Alan T. Band estimated, "electric guitars are heralding the commencement of an era when numerous electrically produced tones will take their place in music of the space age." See Alan T. Band, "Pop Groups Spur Electronics Sales," *Christian Science Monitor*, September 28, 1964, 13.

[61] "Guitar Master Frowns Over Beatles' Music," *Los Angeles Times*, October 25, 1965, C19. In a June 1967 piece for the *Chicago Tribune*, David Cornfield riffed on this generational divide by articulating a new cadre of practice amps with headphone jacks as "silencers": "If you want to tune out that guitar-playing teen-ager of yours, just plug him in. The biggest thing in the music business these days is silence. Electronic gadgets that blot out rock 'n' roll to everybody but the musician are becoming almost as popular as the musical instruments." See David Cornfield, "Rock 'n' Roll Silenced with Electric Gag," *Chicago Tribune*, June 26, 1967, B20.

differentiating the experience of rock from earlier styles of music.[62] In his sociology of amateur music-making, *On Becoming A Rock Musician*, H. Stith Bennett attributes the distinctiveness of this shift to the way in which amplification changes the nature of the forces at a musician's disposal:

> The existence of electric instruments, electronic amplification devices, and electromechanical transducers (speakers) allows the rock musician a control over sound which is larger than human scale, and changes the experience of a performance drastically.[63]

Loud sounds are not just easier to hear. For many listeners, the physical impact—and, in some cases, the potential harm—of loud sound is itself seductive. This discursive trope would eventually come to a head in rock discourse of the 1970s, as bands like Black Sabbath embraced ad copy with boasts like "Louder than Led Zeppelin." As J. Mark Percival has written, the ability to "cope" with the "extreme sound levels" of bands like Deep Purple positioned some as "super-fans," a status withheld from those who get "all shaken up."[64] Although fundamentally disabling, the damage wrought by these events nonetheless functions as a kind of cultural capital; as a test of both endurance and hipness, loudness can function as a boundary of musical belonging. This operation is especially prevalent along generational lines, perhaps most memorably encapsulated

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[62] From the late 1960s and throughout the 1970s and 80s, volume would continue to be implicated in a new discourse focused on the idea of "power." For more on this topic in relation to heavy metal, see Robert Walser, *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music* (Middleton, CT: Wesleyan University Press, 1993).

[63] H. Stith Bennett, *On Becoming a Rock Musician* (Amherst, MA: The University of Massachusetts Press, 1980), 52.

[64] J. Mark Percival, "Stone Deaf Forever: Discourses of Loudness," *Volume!* 11/2 (2015): 29-49.

in Ted Nugent's famous maxim, "if it's too loud you're too old." But even before this theme became ubiquitous in the 1970s, it was already an important trope in the reception of beat and, slightly later, psychedelic music. In a *Los Angeles Times* article published in the Spring before the Summer of Love, Dave Felton emphasized the physicality of this new, electrical music:

> San Francisco electric rock is not so much soul music as it is stomach. There's something about 300 watts of amplified guitars, drums, harmonicas and organ that grabs your lower intestinal region and turns it into a private, pulsating baffle. How much you enjoy the concert may depend on how much you enjoyed your last meal.[65]

The experiential shift instigated by this intensifying focus on electrically amplified sound prompted reconsideration of a perennial question about musical ontology: which sounds are allowed to be considered musical and by whom?[66] But whatever cultural fears electrical instruments may have helped to stoke, the music industry's reticence was quickly dispelled as its coffers were eagerly filled by teenage musicians seeking to emulate their pop idols. While inexpensive, entry-level acoustic and electric guitars often facilitated the entry of many teenagers into the world of rock music-making, it was not at all uncommon for them to spend lavishly on professional quality electric guitars and amplifiers. As Alvin Wolf, owner of a midtown Manhattan music store, reported to the *New York Times* in 1965: "Money doesn't mean a thing…

[65] Dave Felton, "What Happens When Psychedelic Ball Ends?", *Los Angeles Times*, April 13, 1967, A6.
[66] In the beat groups' wake this question was perhaps most poignantly posed by a Bavarian court. Previously, certain forms of entertainment in West Germany were subject to a so-called "amusement tax," including such "low brow" performing artists as wrestlers and jugglers. Musicians, however, were typically exempt from this tax on the grounds that their work provided "cultural uplift"—that same aspiration held by Western suburbs and the music trade. According to the court's decision, however, beat groups were working "to drive their public into spells of ecstasy," and thus a 20% tax should be applied to their receipts. As Billboard reported, the decision was based expressly upon the tools used: the court deemed that "beat groups [were] not 'making music' but 'manipulating electronic devices.'" See "Bavaria Hits Beats with Tax; Beats Beat Retreat," *Billboard*, May 20, 1967, 54.

fourteen and 15-year-olds come in here and spend $300 to $400 in a clip in cash."[67] Michener and Micklin, too, were quick to note the staggering costs assumed by teenage musicians for a full electrical setup. Indeed, after interviewing several groups in Lambertville, Michener concluded that an initial investment of about $2,000 was necessary to even participate in this musical milieu, while upwards of $6,000 was not altogether uncommon. Furthermore, in Michener's estimation, the high costs of the equipment restricted rock music as a wholly white phenomenon, to the financial exclusion of black teenagers. In one of the more dispiriting passages in his piece, he ponders: "Could it be that the cost of the required electrical gear excludes the Negro? Was it an accident that the two bands with the most complete electronic gear carried off the $1,000 and $500 prizes?"[68]

In a full-page advertisement placed prominently on the inside cover of the November 1965 issue of *Star Time*, a bi-monthly pop magazine out of New York City, a blonde man is seen holding what looks to be a classical guitar. In front of him stands an unfamiliar, Gotham-esque object with cold, hard surfaces; its imposing structure would not look out of place on the set of Fritz Lang's *Metropolis*. But if the 1/4" jack-socket on its left is any indication, the object is probably only a few inches tall. Blazoned across the advertisement's top is the pitch: "Ya ya ya—Maybe you could make it like the Beatles with your ELECTRIC GUITAR and AMPLIFIER" (fig. 4). "This is no toy," the ad continues. And it is available for the "amazing low low cost" of $14.95. It must be said, though, that both the guitar and the amplifier are a far cry from the instruments employed by the Beatles and other beat groups. First of all, the battery-powered amplifier would not be able to match the volume produced on stage by the 50-watt Vox

[67] Joan Cook, "The Guitar: New Friend of the Family," *New York Times*, December 22, 1965, 37.
[68] Michener, "One Near-Square Who Doesn't Knock the Rock," 57.

Figure 4. Honor House Products electric guitar and amplifier advertisement, 1965.[69]

[69] Courtesy of the Rock and Roll Hall of Fame and Museum (http://library.rockhall.com).

amplifiers employed by the Beatles on their first US tour, let alone the 15- and 30-watt models they used earlier in their career. Furthermore, if the amplifier was capable of producing such a loud sound, then the hollow-body guitar would inevitably feedback. The ad, then, demonstrates a curious mismatch between the typical musical application of the guitar and amplifier pictured, and the type of guitar and amplifier typically suggested by the phrase "electric guitar and amplifier." Indeed, such advertisements demonstrate the degree to which an instrument's being-electric might function as a sales pitch, regardless of its actual suitability to the musical styles typically associated with an electric guitar.

In the estimation of the *Los Angeles Times*' Sylvie Reice, the Beatles had played a pivotal role in quadrupling the sale of guitars in the United States between 1960 and 1966.[70] And while certainly some of the guitars sold in the Beatles' name were inexpensive entry-level guitars, such as those hawked by Honor House Products, far more important for music retailers in the mid-1960s were the instruments that the group itself used. Indeed, as the anecdotes in the previous section attest, professional quality instruments functioned as a powerful marker of legitimacy for teenage rock groups. In their "Guitar as Artifact and Icon," John Ryan and Richard Peterson interview a number of baby boomers who played in musical groups in the 1960s but ultimately moved on to other professional pursuits. When discussing instrumental choices, they report that their informants found it crucial "to see their heroes, to see what they wore and most importantly what guitar they used. Unlike older generations of apprentice musicians, this 'seeing' was never

[70] Sylvie Reice, "The Swinging Set: Teen-agers, Guitars: A Responsive Chord," *Los Angeles Times*, September 22, 1966, C4. Though Reice's account fails to adequately account for the crucial role played by the folk revival in stimulating sales of guitars, it does attest to the power of the Beatles and Beatlemania to reshape narratives about the instrument's surge in popularity. Although the celebrity of the Beatles should not be underestimated—indeed, this is an idea that I touch upon throughout this project—it must also be reconciled with the historical record as best it can to reveal those places where gaps emerge between different accounts of the same period.

live, but took the form of photos, album jackets, movies, and television."[71] The Beatles, of course, were a powerful force in this respect. As Larry Diehl of the northern California garage band Lil' Boys Blue has said, "If the Beatles began to play certain acoustic and electric guitars, so too did we. We would, in fact, sell our current equipment and go in to hock for the balance just to buy the same guitars."[72] But while amateur and semi-professional groups comprised the majority of the growing market for these instruments, the top groups were also sensitive to the need to emulate those enjoying even greater success. Indeed, the Byrds' own Roger McGuinn has written on his website that the group's initial instrumental expenditures were all done with an eye to the Beatles:

> They [the Byrds] all went to see the Beatles' movie "A Hard Day's Night," and studied the instruments the Beatles were using. With a borrowed $5000.00 and with the trade-in of McGuinn's banjo and guitar they bought a Rickenbacker 12-string electric guitar, a Gretsch 6-string guitar, a Gibson bass, a set of Ludwig drums and three small Epiphone amplifiers. They also got some black suits with velvet collars just like their heroes the Beatles.[73]

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[71] John Ryan and Richard. A Peterson, "The Guitar as Artifact and Icon," in *Guitar Cultures*, ed. Andy Bennett and Kevin Dawe (Oxford; New York: Berg, 2001), 98.
[72] "The Lil'Boy Blues," 60sgaragebands.com, accessed April 13, 2016, http://home.unet.nl/kesteloo/lilboyblues.html.
[73] Roger McGuinn, "BYRDS FAQ LIST," accessed July 5, 2016, http://www.ibiblio.org/jimmy/mcguinn/ByrdsFAQ.html. The Beatles themselves were keenly aware of the professional legitimacy conferred by high-quality music instruments. As Ian Inglis recounts in his *Beatles in Hamburg*, this insight—furnished by a blend of tacit and explicit knowledge—was characteristic of the beat milieu: "Once they had moved to The Kaiserkeller, The Beatles—conscious of their promotion to a bigger and better venue—took advantage of the lessons learned from watching and talking to other musicians to acquire new items of equipment to supplement or replace their existing range." Ian Inglis, *Beatles in Hamburg* (London: Reaktion Books, 2012), 98-99.

For their part, some instrument manufacturers and dealers were sensitive to the power of both celebrity and visual media to generate interest in these new items, especially those who were relatively new to the trade and, therefore, sympathetic to the practical needs of this new breed of popular musician. Correspondingly, firms increasingly sought out artist endorsements in order to connect their products to the fashions of the singles charts. Perhaps no firm pursued these endorsements more aggressively than Vox, who secured the Beatles in 1963 and went on to feature the Rolling Stones, the Monkees, the Dave Clark Five, and countless others over the coming years. The theme of emulation was featured in several of their ad campaigns, perhaps most brazenly in an advertisement published in *Down Beat* in February 1966 that featured an unknown (and possibly fabricated) group with a very on-message moniker: the Breakaways. "What do the Beatles have in common with the Breakaways?", the advertisement asks. The answer, of course, is that they both use Vox equipment, "the sound of success" (fig. 5). This pitch from Vox was only the tip of the iceberg with regard to promotional campaigns launched during the instrument boom of the mid-1960s.[74] And the idea that music merchants were taking teenage groups' professional aspirations seriously was an important feature of the structure and rhetoric of their marketing. The British firm WEM, for example, organized a series of "sit-ins" in the early months of 1968 in order to give groups an opportunity to demo their equipment on the

[74] In addition to print advertisements, instrument manufacturers and dealers engaged in a number of novel promotional campaigns throughout the 1960s. For example, industry personnel organized concerts meant to demonstrate new instruments to the public. One of the largest of these was the 1968 "Singalong with Farfisa," a public concert organized in London by Western Music Co. of Hammersmith and Rank Audio Visual. The concert is reported to have drawn an audience of 3,000 people. See "Instrumental News," *Beat Instrumental* 57, January 1968, 28-29. Toward the end of the decade, amplifier manufacturers began to provide amplification for a host of new, large festivals in effort to promote their brands. The British amplifier firm Orange, for example, provided the amplification for a five-day festival as Les Halles in Paris. See "Instrumental News," *Beat Instrumental and International Recording Studio* 78, October 1969, 44-45. Curiously, a number of instrument firms also developed novelty cars to publicly advertise their products, including Vox's Voxmobile (which was, itself, an amplifier with 32 inputs for guitars and a Vox Continental organ mounted on the back), the Orange stock car, and an oversized Hammond organ mounted on a flat-bed truck.

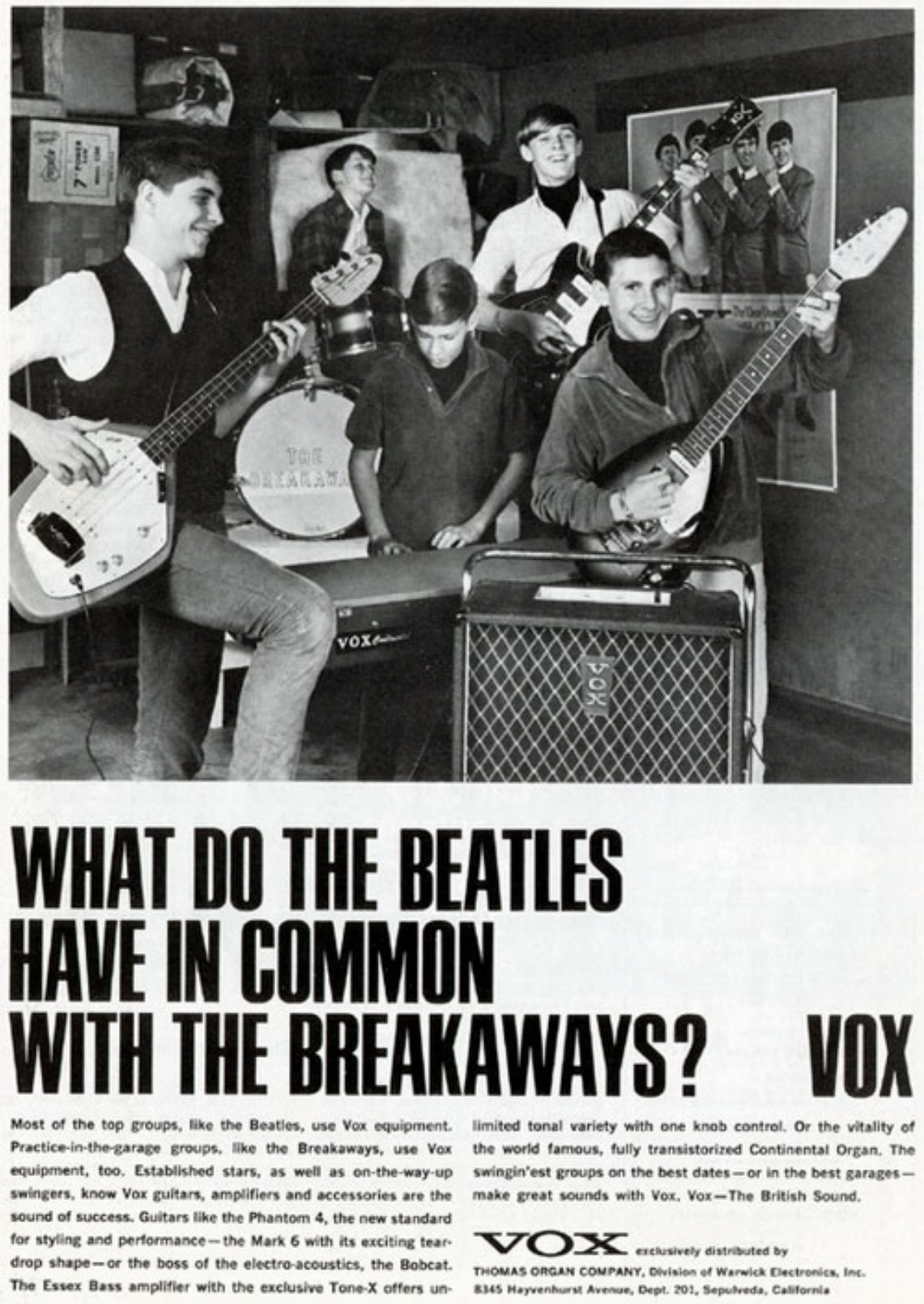

Figure 5. Vox advertisement, 1965.

stage of the Marquee, a small venue in London's West End. While the event offered an opportunity to hear the firm's amplifiers as they would sound in a club, it also gave nascent groups an opportunity to imagine themselves performing on that stage. The sell to hopeful amateurs was perhaps taken to its furthest extreme by the British amplifier manufacturer Marshall. In an advertising campaign launched in 1969, the company utilized the figure of the record company gatekeeper in an effort to valorize the importance of sound equipment that conveyed an artist's vision transparently:

> All right, you guys. So impress me. When you walk into that audition studio, it had better be good. Not just your voices, your songs and your looks. But your sound. Any A & R man worth his weight in gold discs knows that the quality of sound is what good records are made of. That's why your amplification equipment needs to be crack on. Loud and clear. We've known this for a long time. And we've always made amplifiers that give groups and solo artists all the necessary ammunition for winning contracts. Groups like the Move, the Monkees, the Tremeloes, the Bee Gees. Artists like Jimi Hendrix, Cat Stevens, Spencer Davis, the Toast. Switch on to Marshall. And then make a date with the man behind the fat cigar. He'll be impressed. So maybe you ought to start thinking about that nice little cottage in the country for Mum.

As the advertisement frames it, a Marshall amplifier isn't merely a technology for making a sound louder; it is a guarantor of professional success. Crucially, this new Marshall ad campaign was also supplemented by a brochure containing instructions on how to make a demo tape. This type of dream merchandising—that is, selling a tangible good by appealing to its potential to

assist in realizing an aspiration—found further expression in Leslie Lieber's *How to Form a Rock Group* (1968), a promotional campaign for a group called the Forum Quorum disguised as a guide for navigating the music business. Like the aforementioned ad campaigns, Lieber begins by trumpeting the economic rewards lying in wait for young, talented groups playing rock: "This new sound of the 1960s… spawned a remarkable new breed of teenage tycoons—the instant millionaires."[75] Furthermore, Lieber's text corroborates many of the high expenditures for electrical instruments mentioned earlier, especially in the third chapter of her text, entitled "The Big Spending Spree." All told, the five-member group—with some help from their parents—laid out $5,450 in a single trip to Manny's, a Midtown Manhattan music shop that was in business from 1939 to 2009.[76] For its part, Lieber's text was also cashing in on the boom. In a negative review published in the *Performing Arts Review*, Jerry Campbell decried its lack of substantive advice, deeming it "nothing more than a hard cover 'souvenir program book'" documenting a group that ultimately never reaped any significant remuneration.[77] Amateurs' aspirations, then, fueled not only the instrument industry, but also a variety of subsidiary trades that endeavored to capitalize its growth, including such "how-to" books.

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[75] Leslie Lieber, *How to Form a Rock Group* (New York: Grosset & Dunlap, 1968), 9.

[76] Lieber, *How to Form a Rock Group*, 31. Regarding the high expenditures for musical instruments during the mid-1960s, Lieber quotes an anonymous Music Row store owner as saying: "We've never known anything like this…. The kids' pockets nowadays are lined with gold. They used to come in once in a while and buy a couple of saxophone reeds for forty cents. Today if we have a day when we don't take in $10,000 we sneer." Lieber, *How to Form a Rock Group*, 28. (Music Row was a region of Midtown Manhattan on 48th Street West between 6th Avenue and 7th Avenue with several music stores, including Manny's and Sam Ash.) In addition, a 1968 *Billboard* article reported, "the typical five-man teen-age rock and roll combo is now spending $5,000 for equipment." See "Spiraling Instrument Costs Rock Rockers," *Billboard*, January 20, 1968, 1, 12. Indeed, the pages of *Billboard* between the years of 1965 and 1968 are replete with headlines such as "Critical Teen Buyers Clearly Prefer Quality Instruments" and "Milwaukee Teen Groups Lean to More Sophisticated Equipment."

[77] And, judging its success as a promotional vehicle, Campbell writes: "I would like to sum this up by saying that after trying several large record stores in New York, none stocked recordings of 'The Forum Quorum,' and none had heard of the group." Jerry B. Campbell, "Lieber, Leslie; How to Form a Rock Group," *Performing Arts Review*, 1/2 (1969): 383-84.

For their part, the decade's large array of teen magazines also contributed to the professional and economic dreams of their young readers. Early in the decade, the stock and trade of these periodicals was celebrity gossip, marked by its intense focus on personalities and vital statistics. By the second half of the decade, however, there emerged a new interest in the swelling purses of pop culture's fresh-faced stars. A *Teen Pin-Ups* piece from February 1969 entitled "We snoop on the groups and tell all!," for example, juxtaposes the traditional romance and domesticity concerns of such columns ("Manfred Mann simply can't think of anything he'd rather do than sit at home with his wife and two little kiddies") with hard facts about receipts (on the Rascals: "they've just broken the attendance record at the Hollywood Bowl…. They grossed an all-time high of $82,000 for one concert! Nice going, guys."). More importantly, perhaps, were the moments where such gossiping conveyed the possibility that the magazine's readership might emulate the upward movement of then-rising stars. Such rags-to-riches narratives were conveyed in their tidbits on groups such as the Iron Butterfly, "a real up-and-coming group… once so down-and-out financially, they had to search the streets of Los Angeles looking for soda bottles to return for the cash! Not anymore! The group of four handsome young men is getting along quite nicely, thank you."[78]

But it was the Beatles whose economic exploits, as massive and unpredictable as they were, that garnered the most interest and attention. A significant piece in this vein was a *Rave* special from December 1966 entitled "How much is a Beatle worth?"[79] In a curious blend of

[78] "We snoop on the groups and tell all!", *Star Time*, February 1969, 14-15.

[79] *Rave* was launched by the George Newnes publishing company in early 1964. By 1966, when "How much is a Beatle worth?" was published, the magazine had a circulation of about 125,000. And, as Jon Savage notes in a *Guardian* piece documenting the rise in teen pop magazines in the 1960s, the magazine likely catered to readers of both genders: "Like *Fabulous*, *Rave* prominently featured young women writers. Cathy McGowan was a regular, along with Maureen O'Grady and Dawn James. However, if the ads for guitars were anything to go by, *Rave* also appealed to young men." See Jon Savage, "The Magazine Explosion," *The Guardian*, September 6, 2009, accessed April 17, 2017, https://www.theguardian.com/music/2009/sep/06/sixties-60s-pop-magazines-beatles.

tabloid and investigative journalism, the magazine's George Tremblett projected the following figure, apparently unbeknownst to the Fab Four themselves:

> We have examined all the available records, researched the Beatles' company files at London's Board of Trade (where, incidentally, you can see various forms personally signed by the Beatles), and our conclusion is that between them, the Beatles are earning a gross figure of £4 million a year.

The article provides a fascinating look into not only the diverse revenue streams open to the group (records, songwriting, films, live performances, franchise royalties, and so on) but also the potentially exploitative relationship between the group and EMI, who never seems to be able to tell the group how much money they're earning. But for teenage readers, the idea that a young, musical ensemble could simultaneously appear to be having so much fun and to surely be making so much money must have seemed an irresistible prospect. As *Rave* pitched the dream: "There seems to be little doubt that the four Beatles are now well on the way to becoming multi-millionaires. And the eldest Beatle, Ringo, is still only 26!"[80]

The Beatles' wild success fueled the fantasies not only of teenage musicians but also their parents. In the Michener piece quoted earlier, he noted, "parents, enticed by the money earned by the Beatles, had supplied both the initial cash and the impetus [to start a group]."[81] This focus on music as a potential source of income was reflected in a change in the rhetoric employed by one of the most ubiquitous advertising campaigns of the decade: the US School of Music's course for

[80] "How much is a Beatle worth?", *Rave*, December 1966, 6-7.
[81] Michener, "One Near-Square Who Doesn't Knock the Rock," 57.

musical self-instruction. Indeed, throughout the decade their explanation of the potential benefits of musical performance shifted markedly from a focus on personal satisfaction and social utility toward the economic. A 1961 ad explains:

> Imagine yourself being a sought-after guest… making many new friends… entertaining at parties… hearing compliments on your wonderful new talent… attaining new poise and self-confidence… perhaps even making extra money! And best of all, experiencing the deep-down satisfaction that comes from actually creating music whenever you please.

Another ad from 1965 emphasizes many of the same points, but also adds the prospect of "a brilliant musical career." By the end of the decade, however, the US School of Music had fully assimilated the new rhetoric of economic and professional success, especially for teenagers:

> Wouldn't you like to be *really popular* at parties—playing the music everybody wants to hear? Picture the thrill of leading your friends in a wild, *hoot-and-holler* folk-sing! Of rocking the house down with your own combo! Of playing the latest R & R hits, Surf sounds, Mersey Beat! When you can play music, a whole new swinging world opens up for you—a wonderful world of new self-confidence… popularity… new friends… and even extra cash! Many teen-agers earn their spending money by playing at dances and all kinds of affairs. Still others make their career… and tour the country in singing groups and combos!

1.4: How Categories Structure Merchandising

For many purchasers, then, the prospect that acquiring a good-quality instrument might ultimately lead to earning a wage—if not unimaginable success—certainly helped to seal the deal. But, despite the rising popularity and commercial success of these amplified instruments, public schools, which had long been one of the most important institutions for fostering interest in music and laying the groundwork for future instrument purchases, remained wary. As *Billboard* noted in a piece from early 1967 reflecting on the changes experienced in the marketplace over the past two years, the vast majority of band and orchestral instrument dealers had little interest in stocking amplified instruments. Those that did made a concerted effort to control the flow of traffic in their shops, erecting departmental boundaries corresponding to their buyers' different tastes: "some major band instrument dealers are setting up amplified instrument departments separate from other instruments—so as not to offend the sensibilities of the stuffy high school and college teachers. 'They don't even notice that we're selling them,' one dealer said."[82]

Throughout the decade these instruments remained on the periphery of school music programs. This was especially true of the guitar, which was held back by virtue of what Steven Gocel, a Chicago-based guitar instructor, referred to as the instrument's "stigma." In many respects, the guitar's lack of acceptance in school music programs was a direct product of its success in popular music. If a small number of music educators and guitar manufacturers had been interested in pursuing the instrument in stage bands earlier in the decade—when its generic affinities were more evenly spread between the fields of country, folk, classical, jazz, and rock 'n' roll—by the end of the sixties the balance had shifted overwhelmingly toward rock. As Gocel

[82] "Disk Dealers Hit Non-Record Jackpot," *Billboard*, January 28, 1967, 38.

put it, "I don't think enough people are aware that it can be used. They just think of the twanging sound."[83] One of the central tasks of guitar manufacturers, dealers, and educators, then, was to reassert the instrument's historical affiliations with "legitimate" culture. In a 1966 piece for the *Music Journal*, the guitar teacher Leon Block did just this when he emphasized high-status moments in the instrument's long history: "Historically, it brought joy and solace to the courts of kings in the Middle Ages; in the Elizabethan era, it was the delicate accompaniment of poets and lovers."[84]

The guitar also posed other potential threats to the school's relationship with instrument dealers. While the guitar's low cost made it an attractive instrument for band directors concerned with expanding participation in their school's music program, it also threatened to diminish the necessity of purchasing more expensive brass, woodwind, and percussion instruments, a commercial impetus that local dealers had often worked closely with band directors to foster. Furthermore, public schools also had to reconcile the communal nature of their limited financial resources with their role as an expression of civic belonging and pride. As Dick Cory, a band director from Wabash, Indiana put it to *Billboard*'s Ray Brack: "If we had the time and money for guitar instruction, I'd be all for it. But the city fathers expect to build a band, and this is tough enough under the circumstances."[85]

Without the support of schools, instrument dealers and manufacturers worked to create educational opportunities and community for students interested in learning instruments that

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[83] Ron Schlachter, "Need Cited for Guitar in Public Education," *Billboard*, January 4, 1969, 39, 41.
[84] Leon Block, "The Guitar in Music Education," *Music Journal*, May 1966, 33. These examples run contrary to another anecdote that was occasionally recounted in the trade periodicals in the early 1960s concerning the English piano firm Kirkman. As the story goes, in order to counter the rising popularity of the guitar in eighteenth-century England—and, by association, the declining sales of keyboard instruments—either Jacob Kirkmann, the firm's founder, or his sons distributed guitars amongst the lower classes and taught them to play popular songs in order to shift the prestigious symbolic associations that Block describes here. See, for example, Minda, "Profile of a Guitar."
[85] Ray Brack, "Education Demands Guitar Accepted in Schools," *Billboard*, November 30, 1968, 62, 66.

were not readily amenable to school curricula. Some of these took quite novel forms. KQED-TV, the San Francisco Bay Area's PBS channel, for example, broadcast a 29-week folk guitar course with instructor Laura Weber, while various publishers and record labels released recorded lessons with a variety of artists including the Ventures and the Everly Brothers. Far more common, however, was the practice of dealers who maintained lists of local teachers to provide instrumental tutelage, and even some who dedicated space in their stores for the purpose of private and group lessons. Dave Herbert of Charleston, WV's Herbert Music Co., for example, initiated a program for "combo group training" after four months of private lessons, which supported his $1-per-week rental program: "Most of the kids want to play in combos anyway and we found this keeps their interest high."[86]

One of the most outspoken advocates for this work was Kent Sidon, the founder of a Long Island-based school called the Guitar Workshop. And while Sidon embraced the full range of his students' stylistic and generic predilections, including rock, he built his teaching upon a technical foundation rooted in classical guitar pedagogy: "Our whole theme at the Workshop is to teach children this classical technique whether they use it in folk, rock 'n' roll or classical. Regardless of what they may want to pursue in the future, they have the basic technique for producing the best sounds from the guitar."[87] Sidon's approach ingratiated the Guitar Workshop with the New York Board of Regents, who awarded it a charter and status as an educational non-profit, allowing the Workshop to provide high-school credit to students enrolled in its courses. In 1967, he attempted to further expand these educational opportunities through a pilot program to incorporate the instrument in New York public schools. Without public funding for the program,

[86] Julia Sadd, "Critical Teen Buyers Clearly Prefer Quality Instruments," *Billboard*, October 21, 1967, 28.
[87] Jerianne Roginski, "This Modest Guitar Instruction Program an Industry Prototype," *Billboard*, November 4, 1967, 14.

he pitched it to the major guitar trade association, the Guitar and Accessories Manufacturers Association (GAMA). His request was ultimately denied.[88]

Because teaching has long been a major source of income for many working musicians, the guitar's absence in public education has had a curious self-fulfilling quality. If grade school students do not have access to instruction on the guitar, neither do qualified instructors have access to a significant source of paid work. By the same token, if a student—perhaps through tutelage at an independent organization like Sidon's Guitar Workshop—develops proficiency on the instrument and then seeks to further their study at the college level, they might be denied admission for lack of future employment opportunities. This point was outlined by Block, whose instrument was deemed "unacceptable" by his college: "The Board of Education wanted teachers of orchestral instruments and choruses, and the high levels of education geared their programs accordingly."[89] Music education in the United States had come of age with the instrumentaria of military and European concert repertoire, and the guitar, despite its widespread popular and commercial success, failed to make significant headway into this closed system of manufacture and employment over the course of the decade.

And while the guitar's acceptance was inflected by its imperfect interfacing with pre-existing institutions, the development of its signal accoutrement, the amplifier, was likewise shaped by the idiosyncratic structure of the industry. Although the electronics and music industries have shared common commercial interests over the years—including radio, phonograph, hi-fi technologies, and, to some extent, electrical instruments—they have nonetheless remained independent, with differing histories, trade concerns, notions of progress,

[88] "No GAMA Help for Sidon," *Billboard*, February 3, 1968, 17.
[89] Block, "The Guitar in Music Education."

and so on. A crucial juncture in the relationship between the two industries took place in 1967, when the National Association of Music Merchants (NAMM) and the Electronic Industries Association (EIA) were scheduled to host their annual trade shows simultaneously, but in separate cities: Chicago and New York, respectively. While some firms were financially capable of attending both, others had to decide whether the big tent of "music" or "electronics" better represented their wares, as well as the market for their products. As Anthony Dillon, an employee with Aristo Industries, memorably put it: "It seems that a real split has occurred between the flute players, let us say, and the dial twisters."[90] This was an especially pertinent issue for the manufacturers of hi-fi equipment, as these devices might be stocked in both music and appliance stores. For example, Charles Akden of 3M, a large multinational conglomerate based in Minnesota that's responsible for a wide variety of products including magnetic tape, explained to *Billboard* that his firm would attend the EIA conference because of these broad categorical differences: "We are so closely allied with equipment people rather than people that are in sheet music and this kind of thing."[91]

This gap between the intended application of a technology and the principles of its operation highlights an important problem in the practice of categorizing technologies, which is exemplified by the different growth and orientation of NAMM and the EIA. NAMM originally formed in 1901 as the National Association of Piano Dealers of America, a conglomeration of "reputable" piano dealers and a reflection of the longstanding dominance of the piano in the American music trade.[92] Yet it later changed its name to NAMM, in 1919, to reflect the rising

[90] "Electronics Firms Choose EIA Over NAMM Show," *Billboard*, March 18, 1967, 74.
[91] "Electronics Firms Choose EIA Over NAMM Show."
[92] One of the major problems facing NAMM in its early days were a variety of deceitful practices undertaken by unscrupulous dealers, such as fake advertising and stenciling the names of famous piano makers on low-quality instruments. See "60th Anniversary Music Show," *Musical Merchandise Review*, June 1961, 56.

commercial potential of other instruments, such as the guitar and mandolin. Though the specific goods championed by NAMM have shifted over time, they have always fallen under the category of "music" and, correspondingly, have always been available in stores specializing in music products. Like NAMM, the EIA, originally formed as the Radio Manufacturers Association in 1924, emerged to address the trade concerns facing a single product. And, although the organization's concerns overlapped with the field of music in its early years, as it expanded it embraced new technologies allied by virtue of their being "electronic," rather than their application to a specific field of human activity. Correspondingly, the eventual rebranding of the organization as the EIA marked a concomitant shift in focus. Although radio and hi-fi equipment continued to overlap with the concerns of NAMM, other types of emergent electronic technologies such as televisions, computers, and telecommunications did not. The EIA's major retail front, then, was no longer the "radio-music" store but the "appliance" store. While the items implicated by these categorical distinctions might be disparate in function, they were unified by virtue of the technology enabling their function, and frequently a common environment: the home.

This state of affairs presented an especially unique situation for instrument amplifiers. On the one hand, although instrument dealers carried amplifiers, pick-ups, and mics, selling and servicing these items required technical expertise that was not readily possessed by most retailers throughout the late 1950s and early 1960s.[93] While instrument repairs were an important service

[93] Prior to 1964, these items were generally regarded as a type of general musical accessory, not connected to any particular instrument category. Correspondingly, they were not viewed as "big ticket" items, and selling them successfully required effort and diligence on the part of the dealer. As David Wexler noted in an *MMR* article on musical accessories from 1958, "The unit sale may be small but the total volume adds up to a very substantial figure." See David Wexler, "The $25,000,000 accessory market," *Musical Merchandise Review*, March 1958, 26. By the end of the 1960s, however, amplification equipment was routinely counted as a component of fretted instrument sales. See, for example, *Music USA* (Kalamazoo, MI: American Music Conference, 1970), 6.

provided by many dealers, the trade generally acknowledged that they were a financial burden, though one necessary for maintaining long-term customer engagement. Amplification was worse; as *MTR* noted in their 1964 trade fair supplement, "amplification—let's face it—has given the dealer more trouble and has cost him more expense service-wise than anything else that he handles. The manufacturers have not been left unaware of the size of this costly and vexatious worry."[94] Indeed, while *MTR* regularly published how-to articles concerning the service of pianos, brass, and woodwind instruments, such features never addressed the subject of electronics. On the other hand, most major manufacturers of amplification equipment had specialized in hi-fi and radio technologies, and were not eager to shift over to the field of instrument amplification. As one *MTR* writer noted in February 1964, "It has always interested me that the manufacturers of high-quality amplifiers such as Leak, Quad, Rogers, Whitely, Lowther and Heathkit have not attempted to enter what appears to be a lucrative market for instrument amplifiers."[95] This led to a curious situation where an instrument amplifier purchased in a music store could often be more readily serviced in a radio shop, where a technician with proper technical expertise would be available. Indeed, it is surely significant that many of the major instrument amplification manufacturers that emerged over the course of the 1960s began as radio technicians, including Mat Mathias of Matamp (originally Radio Craft Ltd.) and Dick Denny of JMI/Vox.

The guitar and its amplifier thus fell into a series of interstices between pre-existing categories of instruments, institutions, professions, and curricula. These categorical uncertainties shaped the way that the guitar and, by extension, the rock instrumentarium more generally could

[94] "The dealer at the fair," *Music Trades Review*, August 1964 (trade fair supplement), 32.
[95] "Guitar and other amplifiers," *Music Trades Review*, February 1964, 54.

interface with the variety of agents participating in and structuring Anglo-American musical life. While much of the creativity coalescing around and expressed through the rock instrumentarium was, without a doubt, the music produced during this period, the reception of these works was shaped by the creation of new institutions that embraced these technologies beyond the existing hierarchies of legitimacy. We turn now to the important role played by print media in this regard, and consider how they were used to both market musical instruments and shape narratives of popular culture and teenage life in the 1960s.

1.5: Musical Instruments and Lifestyle Marketing

The middle years of the 1960s bore witness to a profound shift in the locus of authority and knowledge with regard to the "quality" or "value" of musical instruments. Prior to 1964, the typical instrument dealer had little doubt that it was their responsibility to assist customers in finding an instrument that would suit their needs and budget, and to provide them with any information about the instrument that they might wish to know. Likewise, dealers were regarded as the principal boosters of their wares, and trade periodicals like *MMR* and *MTR* routinely featured articles sharing promotional tactics that had been developed and successfully implemented by other retailers, as well as materials that had been developed by trade organizations to foster sales.[96] But, as the rock instrumentarium became more regularly

[96] One of the most important annual features of this type was *MMR*'s annual "Christmas promotions and sales suggestions," which provided recommendations about products that were expected to sell well during the holiday season. NAMM also published an annual "Christmas Merchandising Bulletin," which provided its members with suggestions concerning sales and themes, as well as decorative materials. See "Christmas Promotions and Sales Suggestions," *Musical Merchandise Review*, November 1962, 20-23. Other examples of this type of feature include the articles encouraging dealers to interface with local school band directors in order to boost sales. See, for example, "Stage Bands! Your Big Opportunity," *Musical Merchandise Review*, January 1962, 20. In the early 1960s, this was especially borne out by trade's aggressive promotion of the accordion. In 1961 the National Association of Accordion Wholesalers (NAAW) launched a series of seminars held across the United States in order to better educate dealers. The basic outline of the program included: "1. Sales manuals to record the best ideas and techniques for selling accordion; 2. Sales seminars to exchange ideas and build selling knowledge and skills; 3

incorporated into popular culture, consumers began to develop knowledge of and attitudes toward these instruments in an environment beyond the walls of the brick-and-mortar music retail store.

While television promised new opportunities for generating consumer interest in instruments, print media remained the core site of instrument promotion. Indeed, the institutions of the music trade, especially the AMC, had long encouraged dealers to reach out to potential customers through print media, especially the newspaper.[97] In 1962 *MMR* cited daily newspaper readership at 86.4% of all US homes.[98] But, the landscape of print media began to shift in the early 1960s as local newspapers encountered financial difficulties, and as nationally distributed magazines like *Life* and the *Saturday Evening Post* struggled to provide content that spoke meaningfully to a mass audience. One of the most important developments in print media at this time, then, was the establishment of a variety of new special interest magazines that catered to ever-more-minutely segmented audiences and markets. Rather than the "everyman," these new periodicals addressed an imaginary ideal reader, based on a narrowed set of demographic and psychographic traits. In some cases, these audiences were even given expression through the invention of a print avatar, as the American teenage girl was with the 1944 debut of *Seventeen*'s Teena. The invention of Estelle Ellis, *Seventeen*'s promotion director, Teena was meant to embody the "prototypical teen-age girl," a category that assumed increasing social and economic

Merchandising materials to provide accordion dealers effective sales and promotional tools." See "Accordion Wholesalers Reveal Promotion and Advertising Program," *Musical Merchandise Review*, August 1961, 52. The promotional campaign was also augmented by materials produced by the NAAW itself including "carefully prepared merchandising and sales-promotion aids, display materials, direct-mail pieces, newspaper ad mailers and national advertising." See "NAAW Launches Sales and Profit Program," *Musical Merchandise Review*, September 1961, 32.

[97] See, for example, T. M. McCartey, "AMC," *Musical Merchandise Review*, December 1961, 34, 88.

[98] "Christmas Promotions and Sales Suggestions."

significance throughout the decade.[99] As Kelly Massoni writes in *Fashioning Teenagers*, a cultural history of *Seventeen*, Teena served the dual purpose of articulating an ideal femininity that could anchor the magazine's editorial content while also serving as a vehicle for marketing its readership to advertisers.[100] As such, Teena both represented an idea about who its audience was while simultaneously instructing it about who it should be. Theodore Bernard Peterson, in his *Magazines in the Twentieth Century*, highlights this fundamental dynamic when he describes the magazine's "twofold nature as an editorial medium and as an adjunct of the marketing system."[101] As such, the medium "served the system of mass production and distribution by bringing together the buyers and sellers of goods and services, and in doing so they were instrumental in promoting a dynamic, expanding economy."[102] Magazines like *Seventeen* worked alongside new marketing practices to establish a distinct consumer sensibility marked as "teenage"—that is, not childish but not yet adult—especially with regard to clothing. In effect, this growing body of teen magazines functioned as a new type of cultural intermediary, establishing frameworks by which to ascribe positive value to the contents of teen culture beyond the traditional institutions of American society (the school, the church, the government, and so on).

But if the teen magazine targeted a specialized segment of the market population, the pop magazines that proliferated in the 1960s carved out further niches within that same group. Indeed, while the subject of the pop magazine was purportedly music, the tight association drawn between teen culture and popular music—especially rock 'n' roll and British beat—left little

[99] Quoted in Kelly Massoni, *Fashioning Teenagers: A Cultural History of Seventeen Magazine* (Walnut Creek, CA: Left Coast Press, 2010), 10.
[100] See Massoni, *Fashioning Teenagers*, especially chapter three.
[101] Theodore Bernard Peterson, *Magazines in the Twentieth Century* (Urbana, IL: University of Illinois Press, 1956), 387.
[102] Peterson, *Magazines in the Twentieth Century*, 388.

doubt concerning the demographic of its market.[103] And, as the association between rock's electrical instrumentarium and youth was solidified during the British Invasion, pop magazines became an increasingly important site for manufacturers to showcase these new wares. That said, the placement of advertisements was strongly determined by the perceived gender identity of each magazine's readership, and their content by the gendered fantasies of identification normalized by pop culture. As *Rave* framed it in a celebratory editorial published in July 1966, "Did you know you live in a land where all girls are fashion leaders, all boys are guitarists (or drummers) and everybody knows a Beatle, Stone, or at least Eric Burdon?"[104] Instruments, then, were by and large showcased in magazines that had significant male readership. One such periodical was the British magazine *Beat Monthly*, which was launched in 1964 and later rebranded as *Beat Instrumental* (*BI*) and, eventually, again as *Beat Instrumental and International Recording Studio*. *BI*, which I will take up in greater detail in chapter three, was unique for its early treatment of popular music as *music*, with especial attention paid to the use of new instrument technologies in the craft of rock musicians. The gender identity of its readership was surely evidenced by its advertisers' frequent use of female bodies, oftentimes naked, to peddle their wares. Indeed, the tacit misogyny of this practice was brought into stark relief when the magazine elected to print a letter from J. T. Lyle of Thurso, Scotland:

> Over the last couple of months I have noticed a marked increase in the number of advertisements used in *Beat Instrumental* which show partially, or completely naked girls. Now that your publication has increased its price to 5s., I think the standard of these

[103] The idea that popular music is more closely aligned with youth than other age demographics has been influential in shaping the objects of inquiry in popular music studies. For a short history and critique of this premise, see David Hesmondhalgh, "Subcultures, Scenes or Tribes? None of the Above," *Journal of Youth Studies* 8/1 (2005): 21-40.
[104] "Our switched-on land," *Rave*, July 1966, 34.

> photographs should also be elevated. I mention that B.I. is still the best "inside" publication on the music scene, but at your new price—please let's have some nice girls in the advertisements.[105]

Far more inclusive were the pages of *Hullabaloo*, a teen magazine launched in 1966 by Gerald Rothberg and later rebranded as *Circus* in March of 1969. Entering the marketplace after the initial wave of pop magazines but before the firm establishment of new texts concerned with the emergent rock-focused counterculture, *Hullabaloo*'s approach was uniquely inflected by a period of intense fragmentation in the pop culture narrative, which amplified the audience segmentation staked out earlier by magazines like *Seventeen*. Jon Savage's description of the shift is worth quoting at length:

> 1966 was the year of change.… The unitary motion of the high 60s was beginning to falter…. Pop was hoist on the petard of its own success. Having become a big business, it was doing what all big businesses do: diversifying rapidly. The problem for editors was basic: how to keep the readership going with a narrative thread that jumped from the Walker Brothers to Engelbert Humperdinck, the Jimi Hendrix Experience and all points in between.
>
> There were new countercultural magazines. Some of these were short-lived (*Cue*, *Intro*) but others—such as *Oz* and *Rolling Stone*—were better suited to a market where long-

[105] "Letters," *Beat Instrumental and International Recording Studio* 91, November 1970, 62.

> players outsold singles, which they did from 1968 onwards…. Pop chatter became rock writing, with all the consequent highs and lows.[106]

Because of the rapid segmentation of popular music audiences in the second half of the decade, each periodical that touched upon instruments also carved out a tacit understanding about the nature of the relationship between the technology and its assumed readership. Within the domain of print, musical instruments would ultimately find their greatest advocates in the specialized, performer-oriented magazines that emerged later in the decade, such as *Guitar Player*, and the many others that would be published throughout the 1970s and onward. The early mainstays of rock writing—magazines and newspapers like *Rolling Stone* and *Crawdaddy!*—included occasional advertisements for guitars and amplifiers, but by and large these periodicals rarely featured editorial content that covered them in any great detail. As such, they tended to address their audience as listeners and fans rather than as performers (whether potential or actual). By contrast, *Hullabaloo* was a product of both "pop chatter" and "rock writing," and the treatment of musical instruments in its pages is a remarkable artifact of, as well as a testament to, its interstitial belonging. Although it claimed to be for a specifically teenage audience, the actual age of its readers (as suggested by the letters written to the magazine) belies its role as one of the most inclusive, mainstream platforms for engaging with popular music, as well as the rock instrumentarium, at this most significant moment of public interest in it. In its pages, instruments are tools, *objets d'art*, back-to-school shopping, Christmas presents, masks signifying group belonging, and more. It provides an important case study for considering the full extent of the many roles ascribed to musical instruments in popular culture of the 1960s, as it

[106] Savage, "The Magazine Explosion."

furnished its readership with a set of evaluative precepts external to the then-prevailing concerns of the instrument trade and "serious" music culture. The remainder of this section will show how *Hullabaloo* incorporated instruments into many of the features typical of teen magazines and, in so doing, transformed them into an integral (if short-lived) component of teenage culture.

In its earliest years, *Hullabaloo* catered expressly to its self-branded "Hullabaloo generation," boys and girls between the ages of 13 and 19, a demographic that it referred to as "yads" (i.e. "young adults"). At the outset, *Hullabaloo*'s features were closely modeled on the format of the established pop magazines, including frequent photo spreads of the Monkees and reportage steeped in names and vital statistics. But toward the end of 1966, *Hullabloo* attempted to grapple with and accommodate the diversifying tastes of their readership through the inclusion of a variety of critical articles that worked to elucidate the structure, meaning, and history of the music beloved by its fans in an approachable style. But the magazine's efforts to include both "pop chatter" and "rock writing" occasionally provoked some strongly worded letters to the editor. Following an accusation that the magazine had printed false articles on the Monkees, an anonymous "old-time fan" provided a neat summarization of the conflict: "Maybe you tried too hard. You tried to please the Monkee lovers and the Monkee haters, the Stones lovers and haters, the Beatles fans and non-fans. You can't please everybody all the time, so why try?"[107] But as the magazine refined its approach toward "rock writing," which would eventually necessitate its rebranding as *Circus*, it continually received praise from its readers for respecting their intelligence and validating their tastes. As Stephanie Derane of Cedar Rapids wrote in September of 1967:

[107] "Letters," *Hullabaloo*, March 1968, 18.

> HULLABALOO, you're a phenomenon in the world of teenybopper-pleasing magazines. I've come to the conclusion that your publication is the only one that recognizes the fact that its readers may just have an ounce of intelligence. I like to know what's going on in the musical world and you tell it at a level that doesn't insult my intelligence.[108]

Hullabaloo also quickly recognized that their readership might constitute a strong market for musical instruments, and numerous manufacturers—including Hagstrom, Ludwig, Ampeg, Goya, Sunn, Koss, Shure, and countless others—regularly placed full-page advertisements for their products in the magazine. Furthermore, in September of 1967, *Hullabaloo* launched a new "Music Makers" feature that surveyed the newest instruments on the market. In it, author Sid Kleiner provided a blend of "news and views" on the most recent music-making products. In an edition of the column from the October 1967 issue, for example, Kleiner recounts his experience visiting the Goya amplifier factory in New York, posits electric sitars and violin-shaped guitars as the latest trend, and reviews the new Vox wah-wah pedal:

> Outwardly, it gave the appearance of a shiny version of the accelerator pedal in my car. But doubts and reservations were promptly dispelled as the groovy, almost psychedelic sound of the wah-wah penetrated every area of the room. Any electrified musical instrument… becomes groovier when used with this device.… Believe me when I say the effects and variations are limitless. The $95 list price might tend to discourage further

[108] "Letters," *Hullabaloo*, September 1967, 4.

> investigation, but on the basis of our own thrilling experience, we sincerely believe that there is much merit in the product.[109]

Kleiner's prose solicits trust. He speaks from an informed position, but not one burdened by technical jargon. Rather, he familiarizes this novel object by likening it to another technology that his readers have surely encountered. And, like his readers, Kleiner is himself susceptible to the aesthetic pleasures afforded by a device like the wah-wah pedal, and his appreciation of it is compelling. He functions as what Sharon Zukin would term an "honest broker," an authority on mass-produced commodities who "[speaks] from our position in society—the anxious position of shoppers who are trying to balance price and quality."[110] As an honest broker, Kleiner works to reinforce the idea that *Hullabaloo* speaks for a community of like-minded teenage (or at least youthful) readers. Indeed, although *Hullabaloo* positioned itself as an authority on the latest teen fashions, "Music Makers" also invited reader participation; five decades before manufacturers and publishers would become invested in "shares," "likes," "retweets," and the rest, *Hullabaloo* invited their readers to write back if they wanted to contribute: "The purpose of this column is to acquaint you with new products in the musical instrument bag. These products will cover a wide range, from guitar picks to organs. If you have any suggestions, send them in, O.K.?"[111] Such a solicitation reinforced the idea that active participation was a definitive feature of mid-to-late-1960s teen culture. If playing an instrument could start to blur the boundaries between audience and performer, then corresponding with a magazine might do the same. Indeed, sandwiched in the middle of the first "Music Makers" column was a subscription cut-out, entreating teenagers

[109] Sid Kleiner, "Music Makers," *Hullabaloo*, October 1967, 66.
[110] Sharon Zukin, *Point of Purchase: How Shopping Changed American Culture* (New York; London: Routledge, 2004), 171.
[111] "Music Makers," *Hullabaloo*, September 1967, 65.

to "make the Hullabaloo scene" with their $4 subscription and, perhaps most importantly, by "[pledging] to tell all [their] friends about Hullabaloo, the brightest, most colossal, most spectacular pop teen magazine!"[112]

But while the advertisements and instrument round-ups make gestures toward the more "prosumer" features of magazines like *Beat Instrumental,* which position instruments as an end in themselves, their placement in *Hullabaloo/Circus* articulates them as a distinct component of a broader, hip teen lifestyle. In their overview of "Theories of Consumption," Goerge Ritzer, Douglas Goodman and Wendy Wiedenhoft describe lifestyle as "a method of market segmentation":

> It refers to a set of individual experiences and social practices—especially consumption practices—with meaningful interrelations. Lifestyle shopping, then, refers to a series of experimentations with modes of subjectivity, interpersonal relations and social community. What is being consumed are not objects so much as lifestyles with accompanying objects.[113]

One of the first *Hullaballoo* pieces suggesting that the readers of the magazine might themselves want to purchase musical instruments was an October 1966 article showcasing the latest "accessories." Alongside a variety of products such as a Sony TV, a Smith Corona typewriter, and a Norelco shaver, readers might consider purchasing either a Hofner bass ("Want the guitar Paul McCartney uses?") or the Rhythm Ace, an early drum machine. Taken together, these

[112] "Make the Hullabaloo scene," *Hullabaloo*, September 1967, 66.
[113] George Ritzer, Douglas Goodman, and Wendy Wiedenhoft, "Theories of Consumption," in *Handbook of Social Theory*, ed. George Ritzer and Barry Smart, 410-427 (London; Thousand Oaks; New Delhi: Sage Publications, 2001), 420.

interminglings work to position musical instruments as one of many commodities supporting a particular vision of an idealized, middle-class, American, teenage lifestyle.[114] Throughout 1967, these features expanded into full-page advertisements, often juxtaposing progressive musicians like Frank Zappa (for Hagstrom guitars) within a page of some other teen product, such as Pond's Fresh-Start 10-day Wash and Wear Plan (a facial moisturizer). Indeed, *Hullabaloo*'s prominent back cover advertisement often alternated from issue to issue between Fender guitars and Esquire socks, positing a curious equivalency between the roles served by these products in teenage life. Indeed, instruments doubled as an additional type of fad for *Hullabaloo* to champion (and to present trend-setting, advance notice of) in their signature Hullabulletin. An instance of the feature from November 1967 invites readers to inquire about a flattened plane of fashionable objects, including electric autoharps ("It all started with John (Lovin' Spoonful) Sebastian… now everybody's picking up on it"), a new Baldwin guitar catalog ("42 instruments in all!"), and temporary tattoos ("the new craze in body decorations").[115]

As more instrument manufacturers bought advertising space in *Hullabaloo*, it began to print articles that would either encourage more readers to participate in music-making or at least become curious about more of the technical aspects of music-making. One of the first articles of this type was a multi-part feature penned by Kleiner ("Mr. Guitar") entitled "Teach Yourself to Play the Electric Guitar," which began by instructing prospective guitarists how to select an instrument, how to hold it, as well as how to fret a few basic chords ("Watch out Monkees—here

[114] "Accessories," *Hullabaloo*, October 1966, 64-65. Curiously, the Hofner bass ($335) and Rhythm Ace ($299.50) were far and away the most expensive items listed in the collection, nearly double the next most expensive item, the Sony television ($159.95). Although teenagers were not often shy about spending heavily on instruments during this period, when positioned against other products that might fit into a teenager's life these products assume the pricing of luxury goods.
[115] "Hullabulletin," *Hullabaloo*, November 1967, 44-45.

you come!").[116] A second feature, launched in their November 1967 issue, addressed "how a record is made." Although these articles don't address rock instruments per se, they broach the other tools and technologies employed in the production of rock recordings, such as microphones and mixing consoles, and suggest that fans of this music might have some interest in knowing what goes on behind the scenes, a point I take up in greater detail in relationship to rock aesthetics in chapter three. Furthermore, for those readers who were beginning musical projects of their own, some knowledge of the processes involved in making a record would no doubt help them to navigate their own career paths.

In addition, musical instruments—especially electrical instruments—began to constitute the grand prizes in the many contests featured from issue to issue. In the same issue featuring Kleiner's debut article, *Hullabloo* hosted a contest featuring Herman's Hermits with a Fender electric guitar and amplifier as the first prize ("the guitar favored by most young pop groups on the move"). If one of the principal functions of the teen pop magazine was to provide some semblance of access to the stars, then such contests offered an extension of the prose and photos, whether by owning their work, talking to them directly (second prize: "A phone call from Herman—Who himself will dial your number and talk with you on any subject, answer your most intimate questions"), or by transplanting their visage into one's own space (fourth prize: "An autographed Herman's Hermits poster—Herman will gaze on your bed, your desk, your everything in a startling larger-than-life photo").[117] In this context, it's not difficult to imagine

[116] Sid Kleiner, "Teach yourself to play the electric guitar," *Hullabaloo*, August 1967, 30-31.
[117] "Herman's Hermits Contest," *Hullabaloo*, August 1967, 45.

how owning an electric guitar would allow one lucky reader to enact the fantasy of becoming their idol.[118]

Hullabaloo also demonstrated how thoroughly instruments could be incorporated into the standard features of a teen pop magazine. Their "On the Horizon" column, for example, introduces new artists with biographical information. But as instruments came to grow in popularity amongst the magazine's readership, long lists of instruments—especially unusual ones—came to feature as important biographical details, often substituting or augmenting a classic pop mag standby: the likes and dislikes. In an "On the Horizon" column from November 1967 the magazine discusses a new band called Kaleidoscope, which featured several multi-instrumentalists. David Perry Lindley, for example, plays "banjo, fiddle, mandolin, guitar, harp-guitar, and seven-string banjo" while David Solomon Feldhouse plays "saz, bouzoukee, dobro, vina, doumbeg, dulcimer, fiddle, and 12-string guitar." But John Vidican, the percussionist, plays merely percussion. To flesh out his profile, *Hullabaloo* writes instead that Vidican "likes 'food, women, beautiful antique things, hippie junk' and dislikes 'money and too many people.' His hobbies include electronics, photography, art, and books."[119] As instruments emerged as an interesting (and sellable) feature of pop culture, they gradually supplemented the classic details of the star profile, especially vital statistics such as the "inside leg" measurements of *Fabulous*' 1964 feature on the Beatles. This trope was reinforced by another series of articles wherein *Hullabaloo* visited the homes of the members of the Rascals. Their "At home with Gene Cornish" piece from October 1967 blends the kind of gear-talk more typical of *BI* with the behind-the-scenes and lifestyle-focused pieces more typical of the pop mags. In an inventory of

[118] Instruments would continue to constitute the grand prizes in a number of subsequent contests featuring musicians like the Monkees (autoharp) and Sam the Sham (guitar and amp). A February 1968 contest asked readers to describe the "sitar sound" and offered a Coral electric sitar as a grand prize.
[119] "On the Horizon," *Hullabaloo*, November 1967, 31.

the items in Cornish's living room, one finds symbols demonstrating class belonging ("1 [21-inch] TV set," "2 black leather chairs with ottomans") and likeableness ("2 stuffed dogs, gifts from fans," "1 duck decoy on top of the TV near the candles") in addition to his instruments and some home recording equipment ("1 4-track Ampex studio mixer," "1 echo chamber and other recording equipment," "1 Standel guitar amplifier," "1 Guild guitar," etc.).[120] Although this equipment is servicing Cornish's work with the Rascals, his principal source of income, *Hullabaloo*'s writing works to re-contextualize these technologies within the broader constellation of objects implicated in the teen lifestyle valorized by the magazine and its constructed scene.

Taken together, the juxtapositions enacted in *Hullabaloo*'s prose worked to flatten the functional differences of a wide array of objects into expressions of a fashionable teenage identity. This operation came to its apex in a new type of advertisement where the hip prestige of instruments was mobilized to imbue other products with the same. A 1968 ad for Jantzen swimwear, for example, features a trio of young men serenading a woman lying atop a piano, a situation that is deeply incongruous with its ocean-front setting (fig. 6). Indeed, the implausible juxtaposition of the instrument and the environment elevates these teenagers' otherwise mundane recreational activities into the world of dream, a highly stylized version of reality. In these advertisements, musical instruments function as natural extensions of the products adorning the pages of *Hullabaloo* and other magazines of its ilk. Like a pair of Esquire socks or a pair of Jantzen trunks, a guitar (or, as here, a banjo) is something that can be "worn." In all cases, these products constitute a kind of costuming or "mask," to borrow the French sociologist Michael Maffesoli's phrasing, which furnish a potential for identification, if not an identity proper. In

[120] "At home with Gene Cornish of the Rascals," *Hullabaloo*, October 1967, 60-61.

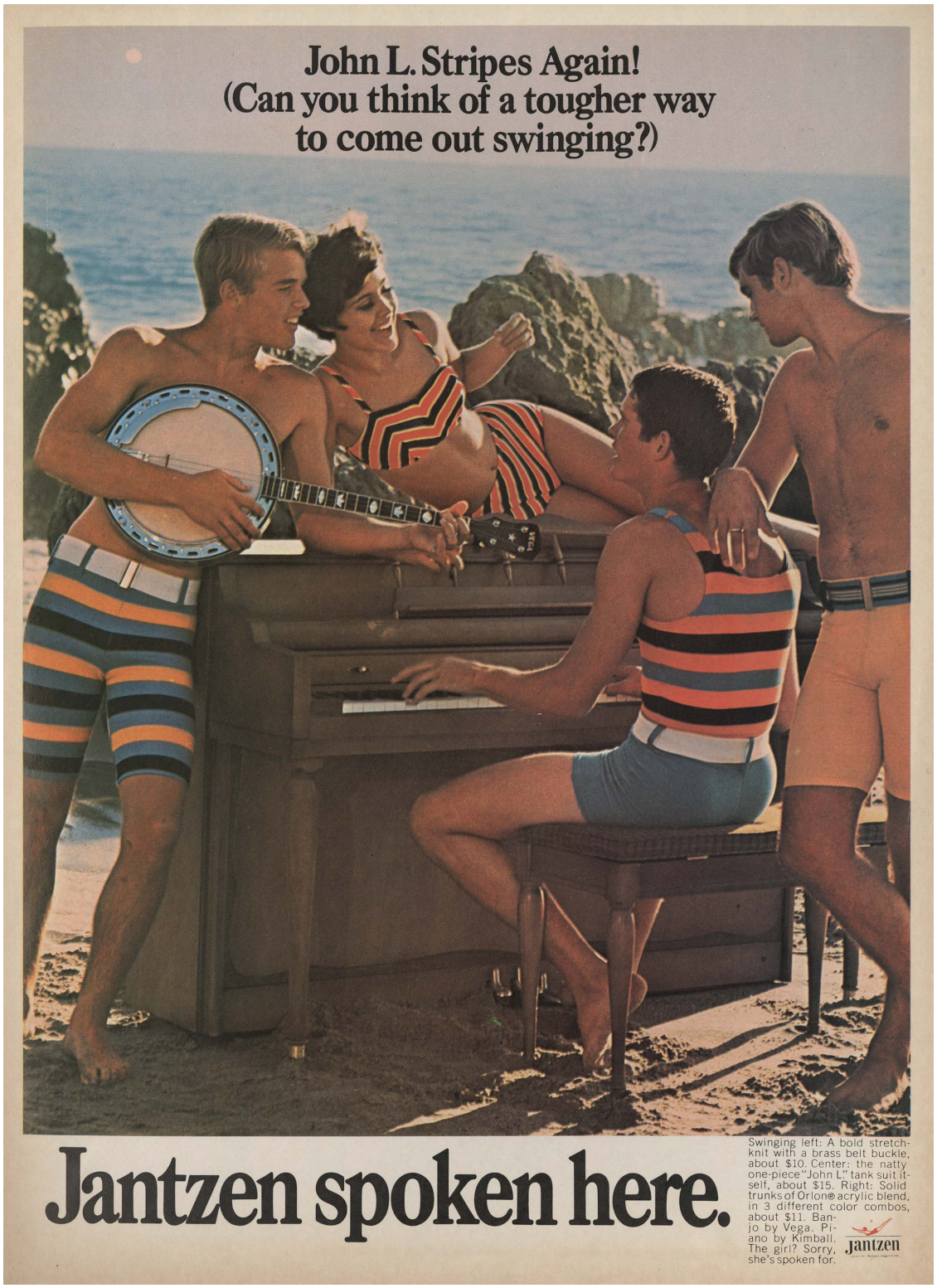

Figure 6. Jantzen swimwear advertisement, 1968.[121]

[121] Courtesy of the Rock and Roll Hall of Fame and Museum (http://library.rockhall.com).

Maffesoli's theory of "postmodern tribalism" he describes the fragmentation of individual identity—once rooted in such seemingly immutable categories as gender or professional belonging—under the weight of the "masses," which lacks a common, unifying experience or identity. As a result, persons shift toward tribal affiliations, characterized by their mutability as they move from tribe to tribe over the course of a lifetime or even a single day. For magazines like *Hullabaloo*, as well as their advertisers, musical instruments could be mobilized as part of a group uniform, facilitating "the recognition of oneself by oneself and by others, and finally, of others by oneself."[122]

Maffesoli's concept of tribal affiliations was given a thorough treatment within the domain of popular music studies by Andy Bennett in his 1999 article "Subcultures or neo-tribes? Rethinking the relationship between youth, style and musical taste."[123] Dissatisfied with the wide—and therefore imprecise—application of the term "subculture," a concept that has been influential within popular music studies especially through the work of the Birmingham Centre for Contemporary Cultural Studies (CCCS), Bennett adopted Maffesoli's terminology in order to explain the flexible and ephemeral nature of the expressions of communal belonging that he observed in his ethnographic work documenting youth dance culture in the UK. While Bennett's work has been useful for thinking past the romanticization of authenticity associated with the concept of subcultures, it has nonetheless been subject to criticism, especially for the way in which it idealizes the agency of tribal members to construct themselves through acts of consumption. This critique was most strongly voiced by David Hesmondhalgh, who took issue with what he described as Bennett's "voluntaristic conception of identity," a premise that fails to

[122] Michael Maffesoli, "Jeux de masques: postmodern tribalism," *Design Issues* 4/1 (1988): 150.
[123] Andy Bennett, "Subcultures or neo-tribes? Rethinking the relationship between youth, style and musical taste," *Sociology* 33/3 (1999): 599-617.

account for any aspects of late capitalism that might impede one's ability to be self-determining.[124] Though Hesmondhalgh remained skeptical of both subcultures and neo-tribes, as well as the related notion of scene, he suggested that the concepts of genre and articulation could be used to work through analyzing collective identities.

My contention is that both Bennett's and Hesmondhalgh's arguments have their merits, depending upon what the concepts they put forward are used to explain. While Bennett was concerned with explaining the experiences of his ethnographic subjects, my study has been principally concerned with analyzing the discourses that the subjects of such an ethnography might have encountered.[125] While, as Hesmondhalgh suggests, individuals may, for a variety of reasons, be hamstrung in their pursuit of "[doing] whatever they want with music and style," surely this is the precise affective state that marketers wish to inculcate.[126] As such, I find the idealization of consumerism present in Bennett's original use of "neo-tribes" less problematic when applied to the analysis of these discourses because, as I've shown, the world depicted in magazines like *Hullabaloo* is unabashedly steeped in fantasy. Nonetheless, the content of that fantasy, as well as the strategies by which it is enacted, remains worth investigating, and articulation is a powerful tool for explaining how the symbols mobilized by a community—however loosely bounded—become animated, and toward what ends.[127] Magazines like *Hullabaloo*, responding to broad shifts in the fashions of popular culture, worked to articulate

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[124] Hesmondhalgh, "Subcultures, Scenes or Tribes?", 25.
[125] Hesmondhalgh's discussion of genre and articulation is not expounded through a concrete example, a point to which Bennett took issue in his reply to Hesmondhalgh's critique. Rather, Hesmondhalgh utilizes the work of scholars like Jason Toynbee, Richard Middleton, and Georgina Born to corroborate his theorization of how the concepts might be applied. See Andy Bennett, "In Defense of Neo-tribes: A Response to Blackman and Hesmondhalgh," *Journal of Youth Studies* 8/2 (2005): 255-259.
[126] Hesmondhalgh, "Subcultures, Scenes or Tribes?", 25.
[127] The concept of articulation is closely associated with the work of the cultural theorist Stuart Hall. For an excellent summary of this idea, see Jennifer Daryl Slack, "The theory and method of articulation in cultural studies," in *Stuart Hall: Critical Dialogues in Cultural Studies*, ed. David Morley and Kuan-Hsing Chen, 112-127 (London and New York: Routledge, 1996).

musical instruments more closely with the life of the "yads" they envisioned as their readership. From the banality of back-to-school to the drive of professional aspiration, these discourses positioned musical instruments in a variety of registers and, in so doing, produced new commodities, modes of identification, and ways of valuing the rock instrumentarium beyond those prescribed by the entrenched authorities of legitimate musical culture.

1.6: Conclusion: Electrify Everything

To return to the epigraph that opened this chapter, my concern here has been to elucidate the factors that shaped the perceived difference, and therefore distance, separating electrical instruments from other music technologies during much of the 1960s. Or, put another way, I ask what factors marked those two guitarists as "electricians," and when, and under what circumstances, did they finally become "musicians"? The paths ultimately traversed by the technologies of the rock instrumentarium—as well as those who adopted them—were shaped by a variety of factors including the structure, predilections, and practices of the instrument trade; attitudes about musical legitimacy and the locus of authority on such matters; the close association drawn between electrical instruments and youth; and the gradual production and adoption of new institutions and media that more readily embraced these technologies. Indeed, these gradual shifts attest to the structure of the music industry, broadly conceived, as a nested assemblage, as an assemblage of assemblages. While a basic economic model of the instrument trade, specifically, would surely include relationships between designers, manufacturers, retailers, and purchasers of musical instruments, an assemblage-based conception of the field might also highlight the interconnections between purchasers and the other agents that affect their musical practices and tastes including, for example, popular musicians. Indeed, a market is

nothing if not a body of desiring subjects and, as this chapter demonstrates, a huge range of agents have participated in the production of desire for musical instruments. As public taste in these technologies shifted toward the electrical over the course of the decade, the cascading effects of this shift impacted the other components of the instrument trade assemblage, who struggled to accommodate this changing market.

Given the trade's initial reticence to electrical instruments, the strategies that they employed to realign themselves with popular taste are themselves remarkable; as the sale of electrical instruments swelled throughout 1964 and '65, instrument design and manufacturing firms were busy devising new products to cash in on the trend. Indeed, the wonderfully diverse instrumental offerings exhibited at NAMM's 1966 conference in Chicago, an important annual event for gauging trends in music merchandising, evinced an overall shift toward electrification encouraged by these burgeoning sales. In the estimation of William R. Gard, NAMM's then-executive vice president, "the trends started by electric guitars is [sic] spilling over into other fields. Electronic versions of everything from pianos to wind instruments will be introduced for the first time."[128] While guitars remained the focus of many exhibitions, attendees were nonetheless met with a farrago of new, far-out instrumental concepts including everything from the aforementioned wind amplification system (Selmer's "Varitone") to a hybrid guitar containing organ circuitry (Vox's V251 Guitar Organ). Ron Wise's evaluation of the event for *Variety*—teetering between intrigue, open-mindedness, and bemusement—is no doubt emblematic: "Perhaps some of the newer musical instruments seem a trifle whimsical or offbeat.

[128] Paul Zakaras, "Record Attendance Expected at 65th Annual Music Show," *Billboard*, July 9, 1966, 53-54.

But in the rapidly expanding music industry there appears to be room for almost everything that can produce a sound."[129]

Wise's assessment would prove especially true the following year, when firms like Baldwin and Danelectro, among many others, would unveil a variety of so-called "amplified ancients," including electric harpsichords, sitars, dulcimers, zithers, and more.[130] Indeed, this strange admixture lead one *Billboard* writer to proclaim, "musical instruments of the ancients and the rustics are experiencing an electrical reincarnation."[131] The '67 Music Show's turn toward "ancient" and "exotic" instruments was a reflection of the increasing prevalence of novel and unusual instrumentation on popular music recordings throughout the preceding year. If the transience of fads once served as an impediment to serious consideration by the instrument trade, by the middle of the decade instrument designers, manufacturers, distributers, and dealers were tracking the ebb and flow of aural fashions on the charts more closely than ever in order to gauge the commercial potential of any featured instrument. No doubt the increasingly eclectic instrumentation of groups like the Beatles, the Rolling Stones, and the Yardbirds gave them much to ponder.[132] But while the production of these "amplified ancients" reflected the music industry's optimism in the unabated growth of instrument sales, it also spoke to an increasingly fragmented consensus concerning popular music trends. While sales of the core components of rock's instrumentarium—electric guitars, basses, and keyboards, as well as drums—have remained steady ever since the 1960s, the vast majority of these "amplified ancients" would

[129] Ron Wise, "Electronics, Cartridge Tape Industry Highlight 64th NAMM Meet in Chi," *Variety*, July 20, 1966, 51, 54.
[130] "The Music Show: A New World of Sound," *Billboard*, July 8, 1967, 17.
[131] Ray Brack, "NAMM: New Musical Sound," *Billboard*, July 8, 1967, 1, 16, 59.
[132] Indeed, throughout 1967, magazines like *Billboard* and *Variety* frequently speculated about the potential salability of myriad instruments being heard on popular recordings for the first time including recorders (The Association), kazoos (Spanky and Our Gang), bouzoukis (The Yardbirds), and more. See, for example, "Rock Groups Lead Search for New Instrument Sounds," *Billboard*, June 24, 1967, 59-60; and Jerianne Roginski, "Dulcimers—Who Sells Them," *Billboard*, August 26, 1967, 16.

ultimately experience commercial failure and become confined to the margins of history as curiosities of a bygone era.

In many respects, then, the phenomenon of the "amplified ancients" constitutes a marked about-face from the trade's long-held attitudes concerning both fads and electronic "gee-gaws" discussed earlier in this chapter, a point surely exacerbated by their lack of commercial success. In the following chapter, then, I interrogate the impetus behind their development as well as the idiosyncrasies of their designs. Whereas chapter one has focused principally on the instrument trade writ large, as well as the idealized audiences postulated by print media, chapter two will take up in greater detail the role played by specific instrument designers in imagining musical instruments and constructing the cultures in which they exist. Because the work of these designers is part of a wide, cooperative network that is oriented toward the production of artworks, we might examine these craftspeople as participants in what Howard Becker has termed an "art world."[133] Indeed, Becker has long emphasized the importance of manufacturers of material goods in providing for the production of art. But while he rightly acknowledges the role that supportive agents like printers and musicians—what he refers to as "cooperative links"—play in restricting the form of new artworks, we might also turn this around and examine how artworks themselves restrict the development of new material supports. Just as artists must navigate a variety of subsidiary crafts and established conventions in order to adequately realize their works, instrument builders depend upon musicians to recognize and employ the objects that they construct as musical instruments. The "amplified ancients" offer up a compelling case study concerning the mutual construction of technology and genre precisely because they ask to be

[133] Howard Becker, *Art Worlds* (Berkeley; Los Angeles; London: University of California Press, 1982).

heard as instruments that participate in genres whose deeply entrenched material conventions are violated by their electrical workings.

Chapter 2 | "Amplified Ancients": Fashioning new "old" sounds

2.1: "Soundmania!"

"This search for new sounds is not going to end for a long while. Groups today are taking 'sound' itself as a form of music—not just the tune. I find more and more artists worrying about their sound."[1]

The epigraph here comes from Steve Marriott of the English group Small Faces, who was interviewed for an article that appeared in the May 28, 1966 issue of *Melody Maker* with the telling title of "Soundmania!" In it, author Nick Jones poses a question that was plaguing the British beat scene at the time: "Where did the fad for using weird sounds and instrumentation start? Who knows." Citing recent releases by half a dozen English groups, as well as the work of Phil Spector and the Beach Boys, Jones posited that pop music had "progressed" from the records of Bill Haley to become something of a hothouse environment where groups were competing with each other to produce something original, striving ever-onwards to push the boundaries of popular music.[2]

Marriott and Jones' comments are part of what was then a nascent critical discourse focused on "sound," which Bernard Gendron has identified as an important element in rock's cultural accreditation. Prior to the emergence of a fully-fledged rock press in 1966 and '67,

[1] Nick Jones, "Soundmania!: Now you're never alone with a sitar—but how far out can the poppers go?", *Melody Maker*, May 28, 1966, 3.
[2] Jones, "Soundmania!".

general interest magazines like *Life* adopted a critical framework based upon "sound" in order to assign positive value to the then-astounding commercial success of rock, which confounded critics raised on the evaluative precepts of Western classical music. As Gendron writes, "No longer dismissed for its flat uniformity, rock 'n' roll was being seen as a complex and not easily decipherable field of distinct styles identified by their unique 'sounds.'"[3] While some critics attempted to ground their discussion of "sound" with technical descriptions of timbral features, Gendron stresses that such efforts were "halfhearted," ultimately yielding a "heterogeneous discourse of sounds" that functioned principally as an extension of the recording and radio industries' practices of "product and trend identification." Indeed, such discourse could be used either to draw groups together under a common banner, usually determined by region (e.g. "Detroit sound," "California sound"), or to identify groups with a new and unique sound.[4]

One of the principal ways in which popular musicians attempted to create a unique "sound" was through the exploitation of novel instrumentation. Suddenly, through the efforts of popular groups like the Beatles, the Rolling Stones, and the Yardbirds, "strange" instruments from well beyond the borders of rock's instrumentarium were becoming a regular feature of pop culture. A revealing glimpse into the fascination that instruments held for fans of popular music emerges in a "behind-the-scenes" look at the recording sessions for the Rolling Stones' *Aftermath* (1966), published in April of 1966 in the *KRLA Beat*. What's striking about the article is both the effort it exerts in simply cataloging the litany of instruments that the group was using

[3] Bernard Gendron, *Between Montmartre and the Mudd Club: Popular Music and the Avant-Garde* (Chicago: Chicago University Press, 2002), 177.
[4] Although Gendron's study focuses on the United States, "Soundmania!" was but one of many similarly framed articles in the British music weeklies that evinced a parallel discursive shift across the Atlantic. A *Melody Maker* article from the summer of 1966, for example, suggests a genealogy of experimental pop rooted in George Martin's work at the BBC Radiophonic Workshop. See "Experiments with sounds," *Melody Maker*, September 17, 1966, 26.

(which no doubt they assumed their readership had some interest in knowing) as well as conferring an air of insider exclusivity to the reader rooted in their access to that list:

> The Stones use a large number of instruments on this new album, many of which were rather unusual. Exclusively in The BEAT, we have a partial list of some of the instruments which you will be hearing. Among them, listen for a dulcimer, a sitar—there will be a heavy Indian accent on this album; seems to be the thing to do these days, some vibes, piano, an organ, a harpsichord, a fuzz organ, and the oddest-looking collection of guitars ever seen.[5]

One of the most striking themes running throughout the Stones' choice of instrumentation is the preponderance of pre-modern (e.g. harpsichord, dulcimer) and non-Western (e.g. sitar) instruments. While the sounds of these instruments provided a marked contrast to the gritty guitar timbres of their early days covering R&B repertoire, they were in lockstep with larger cultural shifts taking place in the second half of the decade. As Simon Reynolds tells it in his book *Retromania*, one of the defining features of the pop cultural landscape of the 1960s was a tension between the modern—marked by innovation and progress, especially within the domains of science and technology—and the "pre-modern" or "exotic"—often understood as a source of

[5] Eden, "Exclusive: BEAT Attends Closed Stones' Session," *KRLA Beat*, April 16, 1966. Such detailed cataloging practices were observable in other kinds of writing, as well. An article announcing a performance by the Boston band Ultimate Spinach at Schenectady, NY's aerodrome lists the instrumentation of the group with an obsessive level of detail, distinguishing between, for example, "bass" and "feedback bass": "The Ultimate Spinach is composed by Ian Bruce-Douglas: vocals, electric piano, electric harpsichord, organ, harpsichord, 12-string guitar, sitar, harmonica, wood flute, theremin, celeste; Barbara Hudson, vocals, electric guitar, hollow body guitar, kazoo; Keith Lohtemen, vocals, drums, tabla, bass drum, assorted bells, chimes; Richard Nese, bass, feedback bass; Geoffrey Winthrop, vocals, lead guitar, feedback guitar, drone sitar, electric sitar." See "Aerodrome to Feature the Ultimate Spinach," *Schenectady Gazette*, April 2, 1968, 8.

Western cultural renewal, and an antidote to modern malaise such as mass culture, consumerism, and war. As Reynolds describes the shift within the domain of fashion:

> Almost overnight, everything stopped looking futuristic. The change was subtle at first, things like Mary Quant basing a design on a garment worn by governesses between the two world wars. But as psychedelia kicked in, youth style started to revel in anything and everything that was neither modern nor from the industrialized West. The vocabulary of late-sixties fashion was based either in *exoticism through time* (Victoriana, Edwardiana, twenties and thirties influences) or *exoticism through space* (ideas from the Middle East, India, Africa) [emphasis in original].[6]

These fashion trends were thus closely mirrored within the domain of popular music. But while drawing upon such "ancient" and "exotic" instruments satisfied a cultural yearning for something to remedy the perceived ills of modern society, it left open the matter of *how* they might be incorporated into contemporary musical practice. For example, would they come "packaged" with traditional performance techniques or would they be adapted to idioms developed on other instruments? How would their forms be modified to suit the dictates of modern musical practice, including larger concert spaces and increasingly frequent touring?

Without a doubt, the introduction of the harpsichord and the sitar into Western popular music proved to be a transformative experience not only for rock—the major generic development in popular music of the period—but for these instruments as well. Indeed, their

[6] Simon Reynolds, *Retromania: Pop Culture's Addiction to Its Own Past* (New York: Faber and Faber, Inc., 2011), 184-85.

sudden prevalence presented manufacturers with a paradoxical situation. While there was an emergent market for these instruments ready to be tapped, the major firms in the United States and England did not have the expertise necessary to produce them.[7] Furthermore, traditional sitar and harpsichord designs presented a number of real obstacles to amateur music makers that could serve to inhibit sales, including their high costs, their fragility, and their need to be carefully maintained and regulated. As we will see, one solution to this problem was to use electrical technologies as a matter of making these "ancient" and "exotic" instruments more convenient for Western consumers. For example, the use of electronic tone production in the design of harpsichords could help alleviate the need to tune the instrument's many strings and to regulate its jack mechanism. Similarly, design could also help facilitate the transference of instrumental techniques from one Western instrument to its exotic, electrical counterpart. Electric sitar designs, for example, usually featured a fretboard closely modeled on the guitar, which allowed guitarists to easily apply skills that they already possessed in the service of playing a new instrument. In both cases, as well, these electrical designs enabled Western manufacturers to take advantage of the modern technologies of mass production, which made these instruments available at a significantly lower cost than their acoustic counterparts.

The resultant hybrid instruments—what one *Billboard* writer pithily described as "amplified ancients"—are the central subject of this chapter.[8] Through many such instruments

[7] While sitars could be imported, they were often damaged in transit. As a representative of the English shop Indiacraft, one of the first stores to handle imports of sitars in the UK, explained to *Melody Maker*: "Sitars are entirely hand-made, and therefore an enormous quantity of them aren't produced. Secondly, they are very fragile and didn't travel very well. We had two consignments that were completely smashed when we opened them." See "How About a Tune on the Old Sitar?", *Melody Maker*, May 7, 1966, 10. DIY harpsichord kits were available for as little as $150 in 1962, but I have yet to come across any anecdotal evidence suggesting that these were of any interest to musicians whose exposure to the instrument was initiated by popular music. For more information concerning these kits, see Jessica Wood, "Historical Authenticity Meets DIY: The Mass-Market Harpsichord in the Cold War United States," *American Music* 30/2 (Summer 2012): 220-53.

[8] "The Music Show: A New World of Sound," *Billboard*, July 8, 1967, 17.

were produced in the mid-1960s, I focus here on four of the best-known and most widely used (the Baldwin electric harpsichord, the RMI Rock-Si-Chord, the Coral electric sitar, and the Rajah Zeetar), as well as a patent for an electronic harpsichord filed and awarded to Jerome Markowitz of the Allen Organ Company that never entered into production. I situate each of these instruments as a possible solution intended to address a series of new design challenges that emerged alongside changes in late-twentieth century musical culture, including larger venues, louder instruments, and frequent touring.[9] My approach here is indebted to the social constructivist perspective espoused by scholars like Trevor Pinch and Wiebe Bijker, who argue that technological artifacts are shaped by the social environments in which they are produced. That is, social groups play a critical role not only by developing new technologies but also by defining the very problems that these technologies are meant to address.[10] In the production of these amplified ancients, designers were confronted with the difficult task of deciding what a given instrument "is" in order to determine which aspects of its construction could be modified without undermining its identity as such. Within the Social Construction of Technology (SCOT), scholars often use the term "interpretive flexibility" to refer to the power of social groups to make judgments about an artifact's most salient features. As J. MacGregor Wise writes, an artifact "*is* what it *means* to society [original emphasis]":

[9] The metal-frame harpsichord designs of builders like John Challis represent another possible solution to this problem.

[10] See Weibe Bijker, Thomas P. Hughes, and Trevor Pinch, eds., *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge, MA; London: The MIT Press, 1989), especially Trevor J. Pinch and Wiebe E. Bijker, "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," 17-50.

> Technology is… contingent on interpretation and interpretive frameworks. The properties of objects are not inherent in the objects themselves but are conferred on objects by social consensus and definition.[11]

One might draw a parallel here with Karen Linn's poignant formulation, presented in her study of the banjo in American culture, that "instruments are more than wood, wire, and glue."[12] Interpretive flexibility helps us to attend to the fluidity and dynamism of that "more," that element of an instrument that exceeds its materiality, by situating artifacts within a culture's ever-shifting hermeneutic horizon. Put another way, to comprehend the musical and social ramifications of the movement of instruments from one culture to another requires explicating the interpretive frameworks governing the receiving end. It is this task with which I will concern myself for the remainder of this chapter.

I begin by adumbrating some of the musical, social, and economic concerns that drew the harpsichord and the sitar into the practice of musicians working in the Anglo-American popular music industry. I focus especially on how the timbres of these instruments interfaced fluidly with pre-existing musical idioms while also producing striking symbolic juxtapositions as a result of both their elevated class and cultural associations, as well as their exotic tinge. Once these instruments achieved a degree of familiarity within the domain of popular music, I show how designers began to modify their forms for the sake of durability and utility, as well as the cultivation of an amateur market. For the sake of clarity, I trace this bipartite history twice, first for the harpsichord and then for the sitar. In the conclusion, I consider both instruments (and

[11] J. MacGregor Wise, *Exploring Technology and Social Space* (Thousand Oaks, CA; London; New Delhi: SAGE Publications, 1997), 11.
[12] Karen Linn, *That Half-Barbaric Twang: The banjo in American popular culture* (Urbana, IL; Chicago: University of Illinois Press, 1994), xi.

their electrical counterparts) together and pose a question of classification: are these “amplified ancients” what they purport to be? While the meanings ascribed to the Baldwin, RMI, Danelectro, and Rajah instruments are rooted in their connection to either the harpsichord or the sitar, their construction owes at least as much (if not more) to the design of other modern instruments, especially the electric organ and the electric guitar. Thoroughly interstitial, I suggest that these instruments’ categorical belonging is largely determined by the generic and technological affiliations of the observer, and that their liminality is the product of eddies in the long history of music-technological development and innovation.

2.2: The “Olde Worlde” Meets the “New”: The harpsichord and its discourses

The sound, image, and idea of the harpsichord has been invoked in a wide variety of popular music genres and discourses. In this first section I will be concerned with elucidating how these generic and discursive contexts each provided novel interpretive frameworks for making sense of what might be termed the harpsichord’s material, social, and historical “facts.” As I will demonstrate, in each context certain of these “facts” are prioritized above others, opening the harpsichord up to a wide variety of music- and meaning-making processes. While this survey cannot hope to provide a complete account of the harpsichord’s variegated employment on the hundreds of popular music recordings on which it was featured in the 1960s, it will propose a basic topology of the musical and discursive spaces occupied by the instrument throughout the decade.

2.2.1: "High" and "Low"

The harpsichord's entry into the world of Anglo-American popular music took place in the late 1930s and early 1940s. This so-called "hot harpsichord," a catch-all period term for discs featuring popular repertoire performed on harpsichord, has been covered most extensively by Jessica Wood. As Wood notes, the harpsichord was most often featured in highly rhythmic genres such as boogie-woogie, which suited the poor sustaining characteristics of modern instruments.[13] The most successful of these "hot harpsichord" pieces was Rosemary Clooney's "Come On-A My House," released in 1951 on Columbia. One of the dominant discursive features of this repertoire was the playful juxtaposition between the assumed "high" cultural register of the harpsichord and the "low" cultural register of the repertoire being realized upon it. One of the features of the harpsichord that enabled this encounter was its perceived timbral similarity to the honky-tonk piano. As Wood explains,

> Both the honky-tonk piano and the harpsichord were instruments that derived their acoustic character from being aged and "weathered." Years of use and disrepair in barrelhouses, bars or attics, honky-tonk pianos and harpsichords were "lo-fi" keyboards that produced jangling "noise" with their pitches, pitches that might even be out of tune.[14]

[13] Jessica Wood, "Keys to the Past: Building Harpsichords and Feeling History in the Postwar United States" (PhD diss., Duke University, 2010), 114. Prior to the emergence of the so-called "Boston School" in the 1950s, most modern harpsichords were manufactured with parts derived from the piano, such as metal frames and open bottoms. Many harpsichord makers who are invested in the production of "historically authentic" instruments, such as Frank Hubbard and William Dowd, would argue that the use of piano-derived features negatively impacts the instrument's resonant qualities to the detriment of its ability to produce what is often described as a "singing" tone.
[14] Wood, "Keys to the Past," 115-16.

While harpsichords were understood as "old" because they had fallen out of favor in the nineteenth century—a phenomenon that has often been explained by recourse to narratives of linear technological and musical progress—the honky-tonk pianos of the Southern barrelhouses were old because of the disrepair wrought by economic and social circumstances. The humor of the genre, then, emerges from the incongruity of the imagined milieux of these two similar-sounding instruments: the disreputable barrelhouse and the aristocratic salon.

2.2.1: "Sophistication"

By the early 1960s, the harpsichord's role in the production of boogie-woogie recordings was, by and large, eclipsed by its presence in rather more wholesome repertoire.[15] Producer Tommy LiPuma, reflecting on his own usage of the instrument with easy listening and soft rock artists like the Sandpipers and Claudine Longet, has claimed, "I never used it as a solo instrument but I added it for background texture or to add sophistication."[16] Sophistication, being a trait that one assumes with the acquisition of worldly experience, is also connected with maturity, an important descriptor for thinking about the assumed or intended audience of a piece of music. Philip Lambert has written about the dominant presence of the harpsichord in the arrangements written for the Four Freshmen's *First Affair* (1960); the tone of the album is decidedly more mature than their repertoire from the late 1950s, when they were a popular group on the college

[15] While Bobby Darin's "Walk Bach to Me" (1961) and Floyd Cramers' "Hot Pepper" (1962) would carry this application of the harpsichord into the early years of the decade, it would soon be eclipsed by a variety of diverging trends.

[16] Marc Myers, "Bach & Roll: How the Unsexy Harpsichord Got Hip," *The Wall Street Journal*, October 30, 2013, accessed November 2, 2015, http://www.wsj.com/articles/SB10001424052702304200804579163670969242120.

touring circuit. As Lambert writes, the instrumental writing supported the album's "juxtaposition of an overall jazzy style with the invocation of a sacred, 'learned' style."[17]

The harpsichord was also a staple of the work of more family-oriented musicians such as Lawrence Welk and his "Family of Champagne Music Makers," including the Lennon Sisters who frequently appeared on his show. Maria Sonevytsky has written about the conservative musical and cultural values associated with Welk—a product of his experience growing up in the Midwestern United States as a German-speaking immigrant—and the processes by which these values were conferred upon the accordion, which Welk played.[18] Given Welk's strong belief that rock 'n' roll music was a negative influence on American culture, it is tempting to see his usage of the harpsichord, which wouldn't find its way into rock music until the mid-1960s, as tapping into discourses about the harpsichord as an antidote to the era's cultural malaise. Indeed, such tropes were observable in the popular press as soon as the first wave of rock 'n' roll emerged on the scene. In a 1959 *Time* article tellingly entitled "Hausfrau at the Harpsichord," a fan of harpsichordist Virginia Pleasants remarked, "It seems that the dry, tinkling sounds emanating from this delicate box satisfy an inherent longing for an orderly perfection which has long been lost in our vulgar present day."[19]

2.2.3: "String Sounds"

As we've seen, in the era of the "hot harpsichord," that instrument furnished record producers with what amounted to an amusing timbral analog to the honky-tonk piano. In the mid-to-late

[17] Philip Lambert, *Inside the Music of Brian Wilson: The Songs, Sounds, and Influences of the Beach Boys' Founding Genius* (New York and London: Continuum, 2007), 9.
[18] See Maria Sonevytsky, "The Accordion and Ethnic Whiteness: Toward a New Critical Organology," *The World of Music* 50/3 (2008): 101-118.
[19] "Hausfrau at the Harpsichord," *Time*, February 23, 1959, 61.

1960s, the harpsichord's timbre would again find favor amongst a new generation of producers and arrangers who were strongly influenced by the popularity of folk music and the acoustic guitars that provided its musical backing. With regard to the production work of Sonny Bono, the Lovin' Spoonful's John Sebastian viewed the harpsichord as participating in what he perceived to be a widespread "string sound" at that time:

> Sonny Bono uses about 4 or 5 guitars at the same time on a session as well as harpsichord, piano and organ, but it's primarily the plucked or struck string on his recording sessions.[20]

Indeed, Bono's aesthetic on *Look at Us* (1965) and Cher's *All I Want to Do* (1965) evinces a debt of influence to the thick and reverberant orchestral textures of Phil Spector's girl group productions. But, rather than use orchestral strings, brass, and woodwinds, Bono made recourse, as Sebastian points out, to the delicate plucked string, a timbre much more closely associated with folk music during this period. And, like the "sophisticated" harpsichord, Bono's plucked-string arrangements played upon the greater level of maturity and seriousness associated with audiences of the folk revival. In this context, then, the harpsichord, one instrument among many in a large arrangement, is valued principally for its timbre rather than its historical or symbolic associations. (As a regular feature of the aristocratic salons of the Renaissance and Baroque eras, the harpsichord's class connotations were a curious match for the progressive left-wing politics of the folk revival.) Indeed, the instrument found itself being articulated as a "new" sound and

[20] Jim Delehant, "The New Thing and the Blue Thing: An Interview with Keith Richards and John Sebastian," *Hit Parader,* April 1966.

was paired with the guitar by virtue of their similar mechanisms of tone production and their complementary timbres.

2.2.4: The "Baroque" in Popular Music

"Just add a harpsichord, a pot of tea, a ginger cat on the windowsill, and you've got the picture."[21]

Fashion scholar Alistair O'Neill has positioned 1965 as the year when "the demand for ever-evolving newness forced a distraction from innovation and invention towards a plundering and interpretation of historical styles" in all areas of popular culture.[22] One of the first rock genres to assume a pronounced historical dimension is what is often termed "baroque rock," which most commonly refers to the transference of certain features understood to belong to "classical" music into the domain of "rock." But while such features may be stylistically specific to music from the Baroque era, oftentimes the aesthetic conceptions characteristic of different eras of Western art music were collapsed under a "baroque" banner. Especial among these are details of orchestration, including the preponderance of "baroque" (and, therefore, markedly non-"rock") instruments such as the harpsichord, trumpet, strings (especially with one or few instruments per part), bassoon, recorder, etc., as well as certain details of figuration such as trills and other ornaments.[23]

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[21] Bob Stanley, "Baroque and a soft place," *The Guardian*, September 21, 2007, accessed November 27, 2015, http://www.theguardian.com/music/2007/sep/21/popandrock1.
[22] Alistair O'Neill, *London: After A Fashion* (London: Reaktion, 2007), 142.
[23] Commentators have occasionally suggested textural commonalities, as well. Elizabeth Upton, for example, has suggested that Sonny Bono's arrangement for his and then-wife Cher's 1965 "faux-baroque" hit "I Got You Babe" "manages to suggest a trio sonata without the use of specialist instruments." This is especially true in the chorus of the song where, unusually, the song's energy is relaxed and the thick instrumentation of the verse is stripped down to reveal only a bassoon, an oboe, and a quietly strummed guitar (punctuated, of course, by the obligatory—but

Bernard Gendron has stressed that the encounter between baroque and rock musics occurred first within the domain of art-music. Indeed, 1965 saw the release of several classical interpretations of the Beatles' music, including the Barock and Roll Ensemble's *Eine Kleine Beatle-Musik* and Joshua Rifkin's *The Baroque Beatles Book*. While *Eine Kleine Beatle-Musik*—which, as the title suggests, owes more stylistically to the music of the late eighteenth century than it does to the seventeenth—was largely missed by the press, *The Baroque Beatles Book* was received positively, rising as high as No. 83 on the *Billboard* albums chart. Gendron has suggested that the Beatles' turn toward arrangements with a deliberately classical or baroque inflection was directly initiated by the success of these interpretations.[24]

The Baroque Beatles Book was conceptualized by Jac Holzman, president and founder of Elektra records. While the music of both the Beatles and the baroque were quite fashionable amongst young audiences in 1965, they represented very different sides of the cultural hierarchy. But Holzman recognized that there was commercial potential for a record that could successfully combine the two. His strategy was to fuse studied interpretations of the Beatles' music in a baroque idiom with humorous and irreverent packaging. This approach allowed the recording to be received as serious baroque music while still tapping into the Beatle phenomenon, something for which many baroque enthusiasts, including Rifkin himself, expressed admiration.

If the *Baroque Beatles Book* might be said to represent the movement of pop's irreverence into the domain of early music—which would be taken to its extreme in the work of P. D. Q.

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gentle—snare-and-tambourine back beat). See Elizabeth Upton, "Concepts of Authenticity in Early Music and Popular Music Communities," *Ethnomusicology Review* 17 (2002), accessed November 11, 2015, http://ethnomusicologyreview.ucla.edu/journal/volume/17/piece/591.

[24] As Gendron writes, "If anything, it is more plausible to assume that the introduction of classically coded components into Beatles recordings was itself partly the result of the spread of classical or baroque readings of their work. George Martin, who himself had established a reputation as a producer of classical records before taking on the Beatles, might well have been aware of some of these discourses and some of these productions." See Gendron, *Between Montmartre and the Mudd Club*, 173-74.

Bach—then one of the most important and frequently cited songs in the development of "baroque rock," the Beatles' "In My Life" (1965), surely represents an important shift in the register of pop's greatest stars as well. John Lennon, the song's principal author, has described it as his "first real, major piece of work" and characterized the hugely successful singles of the group's earlier years as "glib and throwaway." Indeed, the inward focus of the lyrics, which present a meditation on people, places, and events gone by, evince an unprecedented maturity in his songwriting, and a turn toward subjectivity that he attributes to the influence of Bob Dylan's music.[25] The model presented by "In My Life"—wherein a musical feature derived from a "serious" genre of music (George Martin's baroque faux-harpsichord solo, played over a baroque-amenable chord progression) is used to affirm the seriousness of the lyrical subject and, by association, the artistic nature of the entire enterprise—would ultimately prove to be highly influential.[26]

One particularly interesting manifestation of this correlation can be found in the many songs with serious lyrical topics from the period that set the tone with introductory material presented by a solo harpsichord in a quasi-baroque manner. Janis Ian's "Society's Child" (1966), for example, which deals with the subject of interracial marriage, begins in the manner of a slow, somber fugue, with two entries of a short subject in E-flat major before changing affect completely. Similarly, The End's "Loving, Sacred Loving" (1969) begins with a short introduction in the manner of an allemande. In neither case is the musical material presented at the outset later revisited during the remainder of the song. Rather, the sole function of the harpsichord is to prime the listener for the gravitas to follow.

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[25] *Rolling Stone: The Beatles 100 Greatest Songs*, 22.

[26] Martin's solo on "In My Life" was not recorded on a harpsichord. Rather, it was recorded on a piano at half-speed and transposed down an octave. The recorded track was then played back twice as fast in order to shift the pitch upwards, giving it a "tinkling" effect somewhat redolent of a harpsichord.

Nor was the influence of the baroque limited to rock. Folk musicians were also keen to cross generic boundaries between pop and early music, including the baroque. Rifkin himself contributed baroque- and classical-inspired flourishes directly to the folk field through the arrangements that he wrote for Judy Collins' *In My Life* (1966) and *Wildflowers* (1967). Joan Baez's *Noel* (1966), too, featured a variety of early music instruments, including harpsichord, strings, lute, recorders, and bassoons, which provided a sober backing for her renditions of carols. Indeed, although critical reception of the album focused on its supposedly baroque credentials, Peter Schikele's arrangements for the album do not confine themselves strictly to the baroque idiom, and borrow freely from and juxtapose styles spanning the entire history of Western art music. Indeed, one *Melody Maker* writer—who forecast that *Noel* would "certainly appeal to lovers of Baroque music but may be too musically pure for more popular tastes"—even referred to the strings heard on the record as "viols" despite the rather romantic idiom of the string arrangements in pieces like "The Carol of the Birds."[27]

Citing works like Sonny and Cher's "I Got You Babe" (1965), the Doors' "Light My Fire" (1967), and Procul Harum's "Whiter Shade of Pale" (1967), Elizabeth Upton argues that the baroque sounds imported from the early music revival, especially the harpsichord, were heard principally as "cool, hip *new* sounds" (original emphasis).[28] While there is no doubt some truth to this assertion, it is important to emphasize that, even if they were heard as "new" (in the sense of being "novel"), they were nonetheless readily understood to connote the "old." For example, *NME* deemed that the harpsichord featured on the Honeycomb's recording of "Who Is Sylvia?", based on a text by written by Shakespeare and later set to music by Franz Schubert, helped to

[27] "How will Joan Baez lovers react this time?", *Melody Maker*, December 10, 1066, 13.
[28] Upton, "Concepts of Authenticity in Early Music and Popular Music Communities."

"preserve the olde-worlde [sic] quality" of the text.[29] Indeed, such an assessment is supported by the keyboardist's liberal use of trills and other ornaments, ready signifiers of the dignified music played in ages past.

2.2.5: A Remedy for Modern Ills

The harpsichord's association with the "olde-worlde" was a crucial ingredient of its symbolic capital in the wake of its precipitous rise. As I mentioned in the introduction to this chapter, the harpsichord's ascendency was paralleled by a shift in the tastes of youth culture toward objects, fashions, and sounds derived from the past. But what values did the "olde-worlde" carry for 1960s youths? On the one hand, it could provide a sense of security amidst the social upheavals of the era. A *Daily Telegraph* interview with "hip" designer Barbara Hulanicki, for example, reveals, "with everything around her so fast, so uncertain, she needs to go home to… the comfort of dark red wallpaper and Edwardiana. It makes her feel safe."[30] On the other hand, as Reynolds argues, the "vintage," a corollary of the "olde-worlde," could also provide a site for "with it" individuals to demonstrate their knowledge and taste in acts of consumption without engaging in down-and-out "consumerism." Paradoxically, then, the harpsichord's status as an object of fashion was enabled, at least in part, by its perceived opposition to the transience of modern consumerism.

Although the harpsichord was not an essential ingredient in a baroque rock song, it has often functioned as a metonym for the entire subgenre. Part of this, of course, stems from the sheer ubiquity of the instrument in that context. But, while other instruments such as strings were

[29] "Honeycombs' Schubert!", *New Musical Express*, February 18, 1966, 4.
[30] Quoted in Reynolds, *Retromania*, 187.

also a pervasive presence in baroque rock, they were also commonly featured in much of the era's popular music and, thus, did not assume such a marked quality. But part of the harpsichord's symbolic primacy in baroque rock is due to the way in which features of that style have been mapped onto the peculiar properties of that instrument, especially what is often perceived to be its "crisp" tone and low volume. Bob Stanley, for example, compiler of the 2007 retrospective compilation record *Tea and Symphony: The English Baroque Sound 1967-74*, has highlighted the "delicacy" and "restraint" of groups such as the Zombies and the Left Banke—whom he identifies as exemplars of the genre's early manifestation—in opposition to the brashness of the era "when guitar rave-ups ruled."[31]

The harpsichord's "delicate" tone was also understood to be the result of the "delicacy" of its components. As one small-town journalist remarked upon seeing the instrument up close for the first time, "the delicate wood jacks are made of pear wood and the intricacies of the stringing are a real work of art in this day of mass-produced everything."[32] The crafting of such fragile components, then, is the proper domain of the artisan, the embodiment of unalienated labor. Indeed, twentieth-century harpsichord production was principally carried out in small workshops that might only turn out a few complete instruments over the course of a year.[33] Such a laborious and, by modern standards, inefficient practice speaks to an anti-commercial attitude shared by many harpsichord builders. As Jessica Wood has documented, many of the harpsichord workshops of the 1960s and 70s were "outsider spaces" populated by individuals, often quite young, seeking meaningful work in lieu of abundant leisure time or financial recompense.[34]

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[31] Stanley, "Baroque and a soft place."
[32] Dorothy Trebilcock, "Unique Instrument is Owned by Local Couple," *Ludington Daily News*, September 11, 1969, 2.
[33] Although there are factory-produced harpsichords available, these instruments are generally looked down upon by aficionados. See Wood, "Keys to the Past," 107-111.
[34] See Wood, "Historical Authenticity Meets DIY."

Indeed, relative to other musical fields, both baroque and popular musics were dominated by the young. As *New York Times* critic Harold C. Schoenberg noted after a concert of Rameau's music in the summer of '65:

> The impact of baroque and rococo has really hit the younger generation, and last night's audience, predominantly youthful, listened with great attentiveness and obvious knowledge. And so the quiet, intimate, delicate mixtures of the harpsichord got the kind of ovation heroic pianists used to get.[35]

Furthermore, both fields presented challenges to the authorities governing their respective milieux. As early music performers and scholars such as John Butt have argued, within the broader context of art music in the late 1950s and early 1960s, baroque repertoire carried with it a kind of countercultural cachet, and many of those engaged in the historically informed performance (HIP) movement viewed their practice as a way of "redeeming music from its elitist and hierarchical connotations."[36] While some critics of the early music revival—most notably Theodor Adorno—argued that working in the name of fidelity to the past could constrain the present, some recent scholars, such as Laurence Dreyfus, have argued that the past could aid creative musicians in opening up new expressive pathways.[37] Opposition to the hierarchies of the previous generation, especially with regard to class, was also a dominant trope in the rhetoric of England's "New Aristocracy," a cadre of artists and intellectuals that included a disproportionate

[35] Harold C. Schoenberg, "Of All Things! A Rameau Concert Here," *New York Times*, July 20, 1965, 40.
[36] John Butt, *Playing with History: The Historical Approach to Musical Performance* (Cambridge: Cambridge University Press, 2002), 9.
[37] See Laurence Dreyfus, "Early Music Defended Against its Devotees: A Theory of Historical Performance in the Twentieth Century," *Musical Quarterly* 69 (1983): 297-322.

number of pop singers, including members of the Beatles and the Rolling Stones, both of whom made prominent use of the harpsichord, even if they had a tangential relationship to "baroque rock."[38]

2.2.6: The "Ironic" Harpsichord

If the harpsichord could provide a novel timbre in rock music with a "low" register (in the linguistic sense), it could also be used to fuel parody playing up the juxtaposition between high and low. Indeed, as Wood has pointed out, many of the earliest uses of harpsichord in popular music, especially where it was used as a timbral analogue to the honky-tonk piano, highlighted the humor in the harpsichord's "fall" from the domain of high culture. The *nederbeatgroep* Les Baroques presented an interesting take on this paradigm in their 1966 semi-hit "Such A Cad." While the opening passage presents a "baroque" duo of harpsichord and bassoon, the materials played on the instruments are anything but; both instruments are constricted to a harmonic shuttle between D-major and G-major chords, with the harpsichord providing a repetitive upward arpeggiation of the triads in a high register (which no doubt plays up the instrument's "tinkly" quality) and the bassoon playing root notes. After the introduction, the track launches into the chorus with the entry of more typical rock instruments: drums, bass, and rhythm and lead guitars. While the bassoon switches over to playing a catchy motif—a role more typically ascribed to saxophones in this generic context—the harpsichord continues to provide an arpeggiated chordal accompaniment.

[38] For a discussion of the "New Aristocracy," see Christopher Booker, *The Neophiliacs* (Boston: Gambit, 1970), especially 3-21.

While the presence of harpsichord and bassoon in a blues-inflected rock song may seem incongruous, the instruments help to shift the banality of the lyrical content ("Such a cad am I/So mean am I/Baby can't you see it's because you don't love me?") into a comic register. Indeed, singer Gerard Schoenaker's use of the term "cad" to self-describe the protagonist of the song is striking; while other words could certainly have been chosen to describe a man that treats women disrespectfully or dishonestly, "cad" carries with it a humorous tone by virtue of being a twentieth-century anachronism with strong implications regarding class hierarchy.[39]

If the instrumentation and diction of "Such A Cad" might be read as expressive of an irreverent attitude toward class hierarchy—and, by inference, to authority of any kind—this point is hammered home by a short "music video" for the song filmed by Frans Rühl and included as a part of his English-style "pop film" *Brake Down* (1966).[40] The video opens with the five members of Les Baroques clustered around and on top of an upright piano positioned outside on a lawn in a residential neighborhood. Their movements throughout the first verse and chorus are wild, vaguely reminiscent of "air drumming," and three of them even periodically slam their fists against the keyboard in a thoroughly exuberant manner. Such movements may be read in at least two ways. First of all, their physical gestures suggest that the music may be diegetic; their wild movements are *incited* by their own music, playing upon widespread cultural fears about the detrimental effect that rock music, especially its beat, could have upon teenage audiences. Second, their interactions with the instrument—sitting on top of it, banging it, crowding around it—seem to depict them as "primitives," demonstrating a lack of cultivation and of "proper"

[39] The term "cad" has its origins in the late eighteenth century. Related etymologically to "caddie" and "cadet," the term strongly articulates class differences. As such, as an insult it would have been hurled chiefly by those of the upper-class.

[40] Ronald Ockhuysen, "DAT MAKEN WIJ ZELF WEL UIT!", *de Volksrant*, October 25, 2007, accessed November 25, 2015, http://www.volkskrant.nl/film/dat-maken-wij-zelf-wel-uit~a857684/.

knowledge of the piano, itself an instrument with a long history connecting it to standards of good upbringing. But, when the second chorus arrives, the group begins to completely dismantle the piano, tearing off pieces with which to further bludgeon the instrument. While the destructive process lasts the remaining duration of the song, the final shot entails a sudden change in tone, with the band standing together in the manner of a dignified family portrait over a pile of strewn wood and wire.

Although there are famous instances of it from at least the decade prior, the destruction of instruments was just coming into focus in the mid-1960s as a part of popular music's theatrics derived from performance art, especially in the work of The Who's Peter Townshend. But, as Carlos Kase notes, while the destructive art of people like Gustav Metzger could have had a variety of symbolic valences depending on the context of presentation and the political agenda of its creator(s), the meaning of such an act is less clear in such an explicitly commercial enterprise as popular music.[41] Indeed, I do not read the actions depicted in Rühl's video as articulating a coherent political message. Rather, I wish to suggest that their careful manipulation of musical, lyrical, and visual tone evinces a sensitivity to rock music's position in the cultural hierarchy of the 1960s and the codes through which it could communicate; without the ironic juxtaposition presented by Les Baroques' use of harpsichord and bassoon, as well as the humorous tone of Schoenaker's diction, the destructive act would come across as truly senseless. But, released just as rock's position began to move upwards, "Such A Cad" seems to be calling for a return to the playful irreverence of beat music prior to its cultural rise, perhaps better exemplified by the

[41] Carlos Kase, "'This Guitar Has Seconds to Live': 'Guitar Drag's' Archaeology of Indeterminacy and Violence," *Discourse* 30/3 (Fall 2008): 419-442.

Beatles of the films *Help!* (1965) and *A Hard Day's Night* (1964) rather than the Beatles of *Rubber Soul* (1965).

2.2.7: "Acousticity" and the "Pastoral"

By the end of the decade, the harpsichord could also be found in the work of a number of folk and folk-rock bands, including The Incredible String Band, Sunforest, and the Irish Rovers. Given the instrument's once-close ties to the aristocratic salons of the seventeenth and eighteenth centuries, it may seem somewhat surprising to see the instrument featured in a genre that has historically been closely connected to community and working-class identity. But, as many authors have shown, under the weight of the contradictions exposed by folk music's incredible popularity—most famously emblematized by Bob Dylan's 1965 Newport Folk Festival performance—these values became untenable. Nathan Wiseman-Trowse describes the effects on folk music in England thusly:

> This resulted in a shift from a perception of folk music as a socially binding and often class-based set of musical practices that sat exactly within the lives and preoccupations of those who performed it to a facet of rock music that largely refuted class identities in favour of more interiorized and introverted subjectivities that harked back to a pastoral Englishness.[42]

[42] Nathan Wiseman-Trowse, *Performing Class in British Popular Music* (Basingstoke; New York: Palgrave Macmillan, 2008), 107.

As Wiseman-Trowse points out, one of the key features of this "pastoral Englishness" was a reliance on acoustic timbres and instruments. Indeed, part of the legacy of the folk revival has been the entrenchment of what Peter Narváez refers to as the "myth of acousticity," the notion that acoustic sounds are more pure, more democratic, and less mediating than electronically produced sounds.[43] Thus, acoustic instruments—no matter how diverse their origins and symbolic meanings—could be used and combined freely toward the articulation of a musical vision of pre-industrialized Britain. It is in this context that the harpsichord took part in some of its strangest and, perhaps, most whimsical musical textures. The second section in the Incredible String Band's "A Very Cellular Song," from *The Hangman's Beautiful Daughter* (1968), for example, juxtaposes harpsichord, piano, kazoo, recorder, and hand drums.

2.3: "Should Be Eliminated Altogether": The electric harpsichords

Quills, couplers, racks,

Strings, nibs and jacks—

That's what harpsichords are made of!

Thud, rustle, hum,

Neat measured strum—

That's what harpsichords are played of.

— "The Harpsichord" from *The Musician's Mother Goose*[44]

[43] Peter Narváez, "Blues Guitarists and the Myth of Acousticity," in *Guitar Cultures*, ed. Andy Bennett and Kevin Dawe (Oxford; New York: Berg, 2001), 29.
[44] Hope Stoddard, "The Musician's Mother Goose," *Poet Lore* 59/4, January 1, 1965: 370.

"It is astounding what a ravening monster that gentle, archaic, tinkling instrument becomes when juiced up with electricity."[45]

— Theodore Strongin

The sudden prominence of the harpsichord in teen-oriented beat music as of 1965 no doubt presented instrument manufacturers and retailers with a conundrum. On the one hand, the fact that the instrument was being featured in hit singles by high-profile groups was a strong indicator of its commercial potential amongst teenage consumers who, as I suggested in the previous chapter, were eager to emulate their idols. On the other hand, the harpsichord's size, fragility, cost, and lack of timbral versatility posed a number of practical problems for any young musician interested in learning it.

First of all, harpsichords could be staggeringly expensive. While numerous anecdotes from general interest and trade publications in the 1960s attest to both the ability and willingness of teenage consumers to spend lavishly on their instruments, harpsichords easily exceeded even those high figures.[46] The February 9, 1965 issue of *Newsday*, for example, contained a revealing article focused on the rise of amateur music-making in the United States and its attendant costs. One of the core components of the article was a rough comparison of the average prices one could expect to pay for instruments of various categories. While all three varieties of keyboard instruments listed (pianos, organs, and harpsichords) had a similar upper range ($4,500-$5,000), their entry level prices were radically different; pianos and organs were cited as being available for as little as $500, while the lowest average price for a harpsichord was figured at $1,200.[47] In

[45] Theodore Strongin, "Harpsichord Gets Electronic Voice," *New York Times*, January 23, 1969, 55.
[46] I cover this point in greater detail in the previous chapter, especially in section 1.3, "Selling High-Voltage Sounds."
[47] Eugene Miller, "Sound of Music Costs Money: Your Purse Strings," *Newsday*, February 9, 1965, 13C.

an era where music instrument sales were driven principally by amateurs, affordable entry-level instruments were a crucial means for attracting new players and customers.

Any attempt to capitalize on this newfound commercial interest in harpsichords, then, would have to strike an inherently contradictory balance between proclaiming some semblance of fidelity to the category “harpsichord”—articulated by its composition of “quills, couplers, racks, strings, nibs, and jacks”—and, simultaneously, undermining that very fidelity by making recourse to non-traditional materials and designs for the sake of practicality. This section, then, aims to elucidate how different instrument designers approached the problem and, furthermore, to show how these instruments were articulated in relation to the various discourses discussed in the previous section through advertisements.

2.3.1 The Baldwin Electric Harpsichord

The best-known of the electric harpsichords produced in the 1960s was an instrument developed by Caleb Warner and later marketed by the Baldwin piano company. Significantly, Warner developed the design of the Baldwin electric while working at the Canon Guild, a Boston-based harpsichord workshop. Before selling the instrument design to Baldwin, Warner and his electric harpsichord were featured in a special, 1962 issue of *Life* magazine dedicated to “a new breed of American,” “the daring young idea man” who is “finally starting to lay the Organization Man to rest.” It was described thusly:

> Using modern techniques to update an old instrument, Boston development engineer Caleb Warner in his spare time builds and sells harpsichords with aluminum frames and electronic amplification. They are more rugged and reliable than conventional types.[48]

In the public discourse of the first half of the decade, Warner's electric harpsichord was, like many other new technologies being produced then, valued principally for its innovatory qualities. Crucially, the discourse of "historical authenticity," which has strongly influenced the work of harpsichord builders in the second half of the twentieth century, is completely absent in *Life*'s evaluation. Pictured alongside a man who's developed a technique for throwing three boomerangs at the same time, Warner's early electric harpsichord design is articulated positively by reference to the New Breeder's "inventive use of their spare time… the urge to do something out of the ordinary."[49]

Relative to other electric harpsichord designs (to be discussed in the following section), one of the most unique features of Warner's instrument is that its mechanism for tone production is the same as that of an acoustic harpsichord: strings plucked by jacks connected to a keyboard. The principal divergence is that that the instrument does not have a resonating soundboard. Rather, it uses electro-magnetic pickups in order to amplify the sound, much in the manner of an electric guitar. Indeed, this analogy has often been disparaged by harpsichord aficionados. Wolfgang Zuckermann, a harpsichord builder and the author of a monograph on the craft of harpsichords in the twentieth century, has described the instrument as "a glorified electric guitar

[48] "Hobbies," *Life*, September 14, 1962, 116.
[49] "Hobbies," 115.

operated by a keyboard."[50] This point was corroborated by Ruth Nurmi in *A Plain & Easy Introduction to the Harpsichord*:

> This instrument really works like an electric guitar, with the sound being picked up magnetically directly from the strings, not from the soundboard.… While it might be useful to supply some sonority for popular music, it can hardly be taken seriously as a harpsichord.[51]

The Baldwin electric harpsichord, then, represents an interesting attempt to balance the conveniences of electric guitars and organs while, simultaneously, aspiring to provide a rather more "harpsichord-like" experience to the user. For example, one of the main issues plaguing harpsichordists is the need to have someone tune and regulate the instrument. The Baldwin electric, by contrast, is designed so that it can be self-regulated without any prior experience. But, while the Baldwin's 57 strings might take less time to tune than a harpsichord with a larger registration, it's still a far cry from the conveniences of the guitar's mere six strings, as well as the electronically generated sounds of other keyboard instruments, which often do not require any tuning at all.[52]

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[50] Wolfgang Joachim Zuckermann, *The Modern Harpsichord: Twentieth-Century Instruments and Their Makers* (New York: October House Inc., 1969), 78.
[51] Ruth Nurmi, *A Plain & Easy Introduction to the Harpsichord* (Metuchen, NJ; London: Scarecrow Press, 1986), 9.
[52] The instrument also has a register of 1 x 8', which is rather unusual for a harpsichord. But, while different registrations on an acoustic harpsichord would enable the user to create timbral and dynamic contrasts, these functions on the electric harpsichord would be carried out by tone controls on the instrument itself and on its amplifier. Indeed, the instrument's manual includes a chart entitled "SOME USEFUL TONAL COMBINATIONS," which provides instructions for how to manipulate the settings of the Baldwin electric in order to achieve a variety of characteristic sounds. The chart even provides instructions regarding amplifier settings, suggesting that the electric harpsichord and its amplifier, which was employed for the purposes of both amplification and timbral modulation, were conceptualized as a single instrument. The "tonal combinations" listed include a striking mixture of instruments ("Harp," "Banjo," "Oboe," "Organ Reed," etc.), similar to the sounds provided via voice tabs on most combo organs; musical styles ("Chicago," "Steel Band"); novelty effects ("Spooks' Cavern"); and even references to specific musical works ("Rhapsody In Blue—Opening Passage"). Given that keyboard players in the mid-to-late

The design of the Baldwin electric clearly evinces a sensitivity to the rigors and contingencies of gigging. Its Formica and aluminum build is rugged (and protected from barometric fluctuation, that bane of wooden instruments) while its moderate size and decoupled amplifier allows flexible positioning on stage. Perhaps most crucially, the instrument can be set up, broken down, transported, and regulated by a single individual. While the instrument's rather stark, minimalist case has occasioned the ire of those invested in "historical authenticity," there can be no doubt that Warner's choice of dimensions and materials is meant to facilitate transportation of the instrument by means commonly available to most working musicians.[53] Zuckermann's assessment of the aesthetic is exemplary:

> Physically, the design is not very successful; it uses an aluminum channel section in place of wooden case, and three legs without any charm whatever. The Lucite top and music rack give this instrument an outer space quality not easily associated with harpsichord design.[54]

The Baldwin instrument's "outer space quality" is not without significance. While even members of the Boston School of harpsichord makers would take advantage of modern innovations in manufacture from time to time—such as their usage of plastic (Delrin) jacks—the harpsichord

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1960s would have been expected to produce a variety of both standard voices and novel sounds, this list suggests that Baldwin intended for their electric harpsichord to be able to function as a keyboardist's only instrument, a role more typically ascribed to combo organs. Such an assessment, then, would invert the harpsichord's usual role as an "effect" produced by other instruments. See Caleb Warner, *Baldwin Solid Body Harpsichord Owner's Manual*, 3-3.

[53] The manual for the Baldwin electric puts it quite bluntly: "The Solid Body Harpsichord is designed to be readily moved about." In addition to detailed instructions for setting up, regulating, and breaking down the instrument, the manual provides instructions for safely transporting the instrument, even mentioning what size cars it will fit in: "The body fits readily into the smallest of American compact station wagons, into the trunks of many standard-size cars, and can even be 'shoe-horned' into the back seat of many standard-size four-door sedans." See Warner, *Baldwin Solid Body Harpsichord Owner's Manual*, 2-3.

[54] Zuckermann, *The Modern Harpsichord*, 78.

case continued to play an important role in preserving and projecting the instrument's imagined historical ambiance.

Nonetheless, it's clear that the performance of baroque repertory was never the intended purpose of the instrument. As a 1966 brochure for the electric harpsichord explains:

> Sure, we *call* it a harpsichord. And you *can* play chamber or baroque music on it, but don't make the mistake of thinking it's some kind of dusty antique. You can make sounds as exciting as today's, probably even more exciting [original emphasis].[55]

Or, as one *Billboard* writer put it, reflecting upon the instrument's appearance at the '66 NAMM show, "The electronic harpsichord solves a hitherto insoluble problem—how to play big beat on a harpsichord."[56] No doubt sensitive to the increasingly pronounced historicism of hip consumers, Baldwin gradually shifted away from such progress-oriented rhetoric, carefully balancing representations of their electric harpsichord in modern performance contexts alongside catchy pronouncements like "our new product is 400 years old," which positioned it as a "new" yet anti-modern sound (fig. 7).

Scouring the archives of recordings from this period looking for traces of the Baldwin electric harpsichord can be challenging. While some recordings from the mid-to-late 1960s specify whether a keyboardist on the record played "harpsichord" or "electric harpsichord," they rarely specify the particular type of electric harpsichord used. Furthermore, in many cases it is difficult to be certain whether or not a part credited as "harpsichord" was actually an acoustic or

[55] This brochure was reproduced in Mark Vail, *Vintage Synthesizers* (San Francisco: Miller Freeman Books, 2000), 22.
[56] "New Instruments 'Electrify' Show," *Billboard*, July 23, 1966, 63.

Figure 7. Baldwin solid body harpsichord advertisement.

an electric instrument. The acoustic harpsichord's quiet sound often presented engineers with significant challenges balancing levels during recording sessions.[57] The Baldwin, by contrast, could be made louder via an amplifier or even plugged directly into a recording console. As Don Randi, who played harpsichord on the Stone Poney's "Different Drum" (1967), has pointed out, "The ear couldn't tell [the difference between an acoustic harpsichord and the Baldwin], especially when it was added to a larger arrangement."[58] One of the few songs that certainly included the Baldwin electric is the Beatles' "Because" from *Abbey Road* (1969).[59] George Martin uses the instrument to double John Lennon's guitar part, which arpeggiates a chord progression closely modeled on the opening bars of Beethoven's "Moonlight Sonata." According to Geoff Emerick, the group's recording engineer, Lennon was pleased that the inclusion of Martin's part would help to make it "a little more classical-like." Curiously, however, even in Emerick's telling—and it should be noted that he was actually present during these recordings—the instrument Martin played is still, simply, a "harpsichord."[60]

[57] Jessica Wood, for example, has explained the attraction of the harpsichord discourses of "high-fidelity" recordings, noting, "if a recording could realistically capture the elusive sound of the harpsichord, it must be high fidelity." See Wood, "Keys to the Past," 119-28. Regarding the recording session for Lawrence Welk's "Calcutta," Fred Bronson writes: "The Welk version added a harpsichord, which complicated recording in the studio. A microphone was placed inside the instrument while harpsichordist Frank Scott wore earphones to hear what he was playing. The rest of Welk's orchestra couldn't hear the harpsichord, but it was recorded in one take." See Fred Bronson, *The Billboard Book of Number One Hits* (New York: Billboard Books, 1985), 84.
[58] Myers, "Bach & Roll."
[59] The most definitive account of the session is likely to be that of Mark Lewisohn, who reports that Martin's track was recorded on August 1, 1969 on a "Baldwin spinet electric harpsichord." See Mark Lewisohn, *The Beatles Recording Sessions* (New York: Harmony Books, 1989), 184.
[60] Geoff Emerick, *Here, There and Everywhere: My Life Recording the Music of The Beatles* (New York: Gotham Books, 2006), 292.

2.3.2 The RMI Rock-Si-Chord

1967 also witnessed the emergence of the Rock-Si-Chord, a portable electronic harpsichord manufactured by a subsidiary of the Allen Organ Company called RMI.[61] While Allen Organ continued to produce instruments for the traditional venues of electronic organs—principally churches and homes—RMI was established in 1966 to court the bourgeoning keyboard instrument market that had developed alongside beat music throughout the years prior. The firm's initial forays, the Explorer and Lark, both transistorized organs, met with little success; it was not until the release of the Rock-Si-Chord, which was marketed as an electric harpsichord rather than an organ, that RMI gained some traction in the industry.

Several years before RMI was established, Allen Organ founder Jerome Markowitz had worked to develop an electric harpsichord design. Indeed, in 1961 he was conscripted by none other than Lawrence Welk to develop such an instrument for use on his show, and that same year he filed a patent for what he described as an electric "counterinstrument" to the harpsichord.[62] But, unlike Baldwin's electric harpsichord, Markowitz's instrument did not make use of acoustic tone production, the plucked strings so characteristic of traditional harpsichord designs. Rather, Markowitz made use of a pulse-generating circuit, comprised of two resistors and two capacitors, connected to a tone-generating circuit similar in design to Hartley- or Colpitt-type oscillators. According to Markowitz, "The shape of the pulse determines the important musical characteristics of the instrument which result in the distinctive harpsichord tone."[63]

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[61] RMI was an abbreviation for "Rocky Mount Industries. The company was based in Rocky Mount, North Carolina.
[62] Tracey Vasil Biscontini, "Allen Organ Company," *International Directory of Company Histories*, ed. Tina Grant, vol. 33 (Detroit: St. James Press, 2000), 26-29.
[63] Jerome Markowitz, "Electronic Harpsichord Loudspeaker Arrangement and The Like," US patent 3,064,515, filed August 22, 1961, and issued November 20, 1962, 3.

Thinking about the harpsichord's tone in terms of voltage flowing through a carefully selected arrangement of capacitors and resistors represents a sea change in the practice of designing and building harpsichords. In "The Electrical Imagination," Roland Wittje describes the gradual emergence of electrical analogies for describing phenomena that had previously been the domain of acoustics. These analogies took root not only because of the increasing electrification of sound technologies, but also because of the gradual electrification of the laboratory, as well as the structural analogy between acoustic and electrical vibrations. For harpsichord builders, this shift could easily be understood as an incursion of modern thinking upon a historically rooted practice, threatening traditional building practices and skills. As Wittje writes:

> Before the electrification of acoustic measurement, a trained ear and an understanding of the system of European classical music were required [for research in acoustics]. After electrification, the acoustician was not supposed to trust his own ear but had to develop an understanding of the design, behavior, and manipulation of electric circuits and transducers.[64]

For historically minded harpsichordists and harpsichord builders, this shift in thinking and practice violated the basic ontology of the harpsichord. Indeed, in his *The Modern Harpsichord*, Zuckermann argued, "the Allen electronic harpsichord should be eliminated altogether since it merely simulates the sound electronically without using strings or jacks."[65] But, the substitution

[64] Roland Wittje, "The Electrical Imagination: Sound Analogies, Equivalent Circuits, and the Rise of Electroacoustics, 1863-1939," *Osiris* 28/1 (2013): 63.
[65] Zuckermann, *The Modern Harpsichord*, 77.

of an electronic tone-generating mechanism for a mechanical one had ramifications simply beyond the domain of timbre. For Nurmi, this substitution also impacted the instrument's "touch" or "action." As she writes, "It is like a specialized electronic organ designed to simulate the sound of the harpsichord, as its touch simulates the tracker touch of an organ."[66] As her comment attests, the "feel" of an instrument is also an important determinant of its categorical belonging. Historically, both the touch and the timbre of diverse categories of keyboard instruments have been mutually determined by their distinctive tone-producing mechanisms. For example, a piano felt and sounded like a piano by virtue of its striking hammers, while a harpsichord felt and sounded like a harpsichord by virtue of its plucking jacks. The application of electrical technologies, then, violated these categorical distinctions by allowing designers to graft the touch of one instrument to the timbre of another.

Markowitz's patent reveals little concern that the touch of his electric harpsichord match that of its acoustic model. Rather, in a move that beautifully demonstrates the instrument's interpretive flexibility, he locates the distinctive character of the harpsichord rather elsewhere:

> A harpsichord, in its more important usage, constitutes a personalized musical instrument, in that it is perhaps more frequently played for the enjoyment of only the player of the instrument.

He then goes on to explain the rationale for the distinctive loudspeaker arrangement of his instrument, emphasizing that "true harpsichord sound" is not strictly a product of the instrument's signature tone-producing mechanism (jacks plucking strings), but also a particular

[66] Nurmi, *A Plain & Easy Introduction to the Harpsichord*, 8.

spatial distribution of the sound, with the transient of the pluck occurring close to the player and the resonance of the string in the soundboard occurring further away: "I have found in practice that this speaker arrangement is important to the generation of a true harpsichord sound, particularly as heard at the location of the harpsichord player."[67] While harpsichord makers concerned with "historical authenticity," such as Zuckermann, would stress that an instrument's belonging to the category "harpsichord" was contingent upon its having a strict set of components, Markowitz locates the distinctive qualities of the harpsichord in a particular modality of audition and spatial distribution of sound.[68]

RMI's design for the Rock-Si-Chord speaks to a similar concern for being "harpsichord-like" while using an altogether different technological paradigm. Indeed, although the instrument's tone generation, modulation, and amplification are all handled electronically, advertisements for the instrument nonetheless touted it as "the new instrument with authentic harpsichord sound." Such a concern may be seen, for example, in the Rock-Si-Chord's registration controls. While contemporary combo organs might contain a variety of drawbars or tabs for tonal variation, the first Rock-Si-Chord, the so called "Model 100," contained only a single 8' tone-generator with "string" and "lute" stops. This design reflects the common inclusion of a special lute stop effect on acoustic harpsichords, a separate row of jacks that pluck close to the nut in order to produce a more penetrating, trebly sound.[69] But while simultaneously engaging two sets of jacks on a given set of strings produces a bad effect on an acoustic

[67] Markowitz, "Electronic Harpsichord Loudspeaker Arrangement and The Like."
[68] Zuckermann defines the harpsichord thusly: "A harpsichord can be defined as possessing (1) a group of strings, each string having a single pitch; (2) a resonating chamber; (3) a device to active the strings (by plucking) and produce the sound; and (4) a keyboard to control that device." See Zuckermann, *The Modern Harpsichord*, 9.
[69] In an acoustic harpsichord, different timbres may be produced by placing sets of jacks at different points along a set of strings; jacks plucking closer to the nut will produce a more penetrating and nasal tone, while jacks plucking further away will sound more mellow.

harpsichord, the separate tone generators for the Rock-Si-Chord's "string" and "lute" stops can be engaged simultaneously to good effect, providing the instrument with more tonal variation than its single 1 x 8' disposition would suggest.[70]

The Rock-Si-Chord's release in 1967 was accompanied by a striking series of advertisements. An ad from October of that year features a large picture of the members of the Lovin' Spoonful, one of the most prominent groups to sign an endorsement contract with the firm (fig. 8). The top of the ad is graced by the text: "Rock Bach Mild Wild Cool Ghoul Movin' and Groovin'." Both the tone of the language and its presentation, marked by the liquid quality of the characteristically psychedelic typeface, are clearly designed to tap into a hip, "insider" clientele (or, at least, to give the illusion that the instrument might confer such values to its purchasers, who can, of course, find the instrument at "progressive" music stores). But while the seemingly free flow of the rhymed pairs suggests the unconscious act of word association, an activity with strong resonances in the popular culture of '67, the terms are no doubt chosen deliberately to tout the range of the instrument's expressive capabilities and its versatility. Furthermore, it's striking that, while Baldwin clearly emphasized the "new" sound/"old" instrument dichotomy, RMI only obliquely hints at it.

Despite the instrument's claim to "authentic harpsichord sound," it's electronically generated tones prevented it from "passing" as a harpsichord in the same way that Baldwin's electric instrument was often able to do. Indeed, as *Sound on Sound* contributor Gordon Reid has written, the Rock-Si-Chord, as well as RMI's later Electra-Piano and Harpsichord, would ultimately find favor primarily amongst progressive rock musicians such as Rick Wakeman and

[70] A 1 x 8' disposition is rather uncommon on harpsichords. The most common 18th-century disposition was 2 x 8', 1 x 4'.

Figure 8. Advertisement for the RMI Rock-Si-Chord.

Tony Banks.[71] The generic space of progressive rock, governed by aesthetic concerns distant from notions of "historical" or "folk" authenticity, readily furnished the instrument with an environment where it could find value despite the apparent contradiction posed by its high cultural associations and unique, electronic sound.

2.4: How to Make Your Guitar Sound Like a Sitar

In a video entitled "How to Make Your Acoustic Guitar Sound Like a Sitar" guitarist Daniel Kalisher takes an ordinary wooden spoon, which he admits he usually uses to "mix pasta and stuff," and wedges it between the strings and body of his flat-top guitar, adjacent to the bridge. He then strums his guitar downward, revealing the instrument to be tuned in open fifths, and proceeds to "noodle around" in a mixolydian mode, his playing suffused with string-bends and rapid ornamentation decorating his largely conjunct lines on the high E- and B-strings. While the simple sound-altering process that Kalisher outlines in this video—which has received over 200,000 views since being posted in November of 2008—is worlds apart from the construction of an actual sitar, it ultimately yields a certain "sitar-like" timbre.[72]

Kalisher's video is but one of dozens of such "how-to" videos on YouTube that provide instructions for achieving a "sitar" sound with a guitar. This concern for recreating the sound of a sitar on a guitar has a long history, dating back fifty years to the dawn of the "great sitar explosion," a unique period in the history of Western popular music when Indian music and instruments, especially the sitar, came to exert a profound influence on Western sounds, styles,

[71] Gordon Reid, "PROG SPAWN!: The Rise And Fall Of Rocky Mount Instruments," *Sound on Sound,* December 2001, accessed November 2, 2015, http://www.soundonsound.com/sos/dec01/articles/retrozone1201.asp
[72] Daniel Kalisher, "How to Make Your Acoustic Guitar Sound Like a Sitar," YouTube video, 3:21, November 8, 2008, https://www.youtube.com/watch?v=Dcqs8FVN_KI.

and values.[73] One of the most significant forces driving this encounter was the electric guitar, the defining instrument of sixties pop. Superficially, at least, the guitar bears a structural resemblance to the sitar, and while points of unqualified commonality between the cultures of Western pop and Indian classical music were few and far between, the guitar nonetheless functioned as a kind of "mediator" or "guide" throughout this encounter, a patch of stable ground on which Western musicians were able—if they tried—to contextualize the difference and nuance of Indian music.

Authors such as Gerry Farrell, Laura Leante, and Pedro van der Lee have done considerable work elucidating points of crossover between Indian music and Western pop, especially with regard to the music that George Harrison wrote for the Beatles.[74] But if Harrison's "Love You To" and "Within You, Without You" were understood to be some of the deepest and most sincere attempts to fuse the idioms of "East" and "West," it bears mentioning that the many other musicians who encountered and used the sitar during this period thought about it very differently, often simply as an "exotic" guitar effect. Indeed, the sitar's vogue in British pop was ultimately undermined by musicians using the sitar, or a guitar sounding like one, in this very manner. But as the British fad faded, interest in the sitar spread to the United States, where instrument manufacturers such as Danelectro would seek to capitalize on the two instruments' perceived similarities through the production of hybrids like their "electric sitar."

This section, then, seeks elucidate how Western popular musicians' understanding of the sitar was mediated through the guitar, especially in light of the timbral and expressive

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[73] This phrase comes from Ravi Shankar's 1968 autobiography. See Ravi Shankar, *My Music, My Life* (New York: Simon and Schuster, 1968), 92.

[74] See, especially, Gerry Farrell, *Indian Music and the West* (Oxford: Oxford University Press, 1997); Laura Leante, "Love you to: Un example de rencontre entre musique indienne et musique pop dans la production des Beatles," *Cahiers de musiques traditionnelles* 13 (2000): 103-118; and Pedro van der Lee, "Sitars and Bossas: World Music Influences," *Popular Music* 17/1 (1998): 45-70.

affordances of amplification. Similarly, I'm concerned with adumbrating how musicians, critics, and fans received the music produced during these encounters, and what terms they used to evaluate it. In order to begin broaching this topic, I begin with a discourse that emerged in early 1966 in the British music weeklies, which provided an important forum for debating the significance and meaning of the sitar, as well as what its "proper" usage in a pop song, if any, should be.

2.5: "How About a Tune on the Old Sitar?": England

"It all started with a Beatle album."[75]

"The sitar is the name to drop nowadays, but it is rapidly becoming old hat."[76]

After the December 1965 release of the Beatles' *Rubber Soul*, which featured George Harrison playing a sitar on the John Lennon-penned "Norwegian Wood," the sitar became an unavoidable subject in *Melody Maker* and *New Musical Express*'s editorials and interviews until the autumn of 1966. But while interest in the instrument appeared to develop in earnest throughout the winter and spring of '66, by the summer it had become an abused cliché, damaged, in the eyes of many, by one too many groups using it as an exotic "effect" without any regard for the specificity of its traditional technique and idiom. In this section I track the sitar through the British music weeklies to elucidate what the sitar meant to British beat musicians and fans in the first half of 1966 and how it inflected these groups' search for a unique "sound."

[75] "The Old Becomes New," *Billboard*, July 15, 1967, 19.
[76] Jones, "Soundmania!".

While "Norwegian Wood" has often functioned as a point of origin in the history of the sitar in Western popular music, it is now understood that the Beatles' use of the sitar was not an isolated incident. Rather, as authors such as Jonathan Bellman have shown, other musicians operating within the Beatles' milieu, such the Kinks' Ray Davies and the Yardbirds' Jeff Beck, were experimenting with the sitar and sitar-like sounds contemporaneously with, if not earlier than, Harrison himself.[77] But, if an interest in the sitar and Indian music was not unique to the Beatles, they nonetheless played an important role in this history, by virtue of their media attention and prominence as musical tastemakers and trendsetters, as no other group could. As Farrell has put it, "it took the Beatles and a media which had a seemingly insatiable hunger for all that band's activities to catapult Indian music to the forefront of public awareness and, briefly, make the sound of the sitar a common feature of popular culture in the West."[78]

After Harrison's first public foray with the instrument, the British press, by and large, received the sitar and sitar-like sounds positively throughout the winter and spring of 1966. For example, the Yardbirds' "Shapes of Things," released in February '66, was lauded by *Melody Maker*, especially with regard to Beck's guitar playing: "Beck achieves a sitar effect on guitar and contributes much to the group's very individual noise. The boys deserve full marks for coming up with something different."[79] This short evaluation of the song encapsulates brilliantly the values at stake for musicians working in this milieu; if Harrison had already "claimed" the sound of the acoustic sitar, then Beck's mimesis could still furnish the Yardbirds with a sufficiently novel timbre to satisfy a critic focused on sound.

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[77] For a detailed account of the various paths that British beat musicians took in attempting to incorporate musical devices derived from Indian music, as well as the sitar itself, see Jonathan Bellman, "Indian Resonances in the British Invasion, 1965-68," *The Journal of Musicology* 15/1 (1997): 116-36.
[78] Gerry Farrell, "Reflecting surfaces: the use of elements from Indian music in popular music and jazz," *Popular Music* 7/2 (1988): 189.
[79] "New Records: Great Beck guitar means a big, big Yardbirds hit," *Melody Maker*, February 19, 1966, 18.

Nonetheless, it's worth pausing for a moment to consider where we might locate this "sitar effect" in Beck's solo on "Shapes of Things." Many critics have identified the eerie, droning sound heard in the solo, which Beck produced through the use of "controlled feedback," as its most distinctive feature. Beck himself has described this sound as "just some weird mist coming from the East out of some amp," totally unexpected and startling to his bandmates.[80] While no doubt still a novel timbre for Western pop audiences of the time, "Shapes of Things" was neither the first song to make use of guitar feedback nor the first experiment with guitar feedback inspired directly by the East. Bellman has highlighted the Kink's July 1965 song "See My Friends" as a significant early usage of the technique, writing, "[Ray] Davies sought to achieve an Indian sound, substituting controlled feedback for the drone."[81] Regardless of the precise origin of the association between certain uses of guitar feedback and the drones found in Hindustani classical music, it is clear that this association was in operation by the time that the Yardbirds released "Shapes of Things."[82]

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[80] Jeff Beck quoted in Alan di Perna, *Guitar Masters: Intimate Portraits* (Milwaukee, WI: Hal Leonard Books, 2012). Beck's use of the world "mist" to describe this sound is striking, as it taps into a lexicon of sonic orientalism rooted in clichéd notions of a "mysterious" east. For more on the idea of "sonic orientalism," see John Corbett, "Experimental Oriental: New Music and Other Others," in *Western Music and Its Others: Difference, Repetition, and Appropriation in Music*, ed. Georgina Born and David Hesmondhalgh, 163-186 (Berkeley and Los Angeles: University of California Press, 2000).

[81] Bellman, "Indian Resonances in the British Invasion," 120.

[82] Jimmy Page would later corroborate this point in a piece that he wrote for *Melody Maker* on the use of the sitar in British beat scene, noting that timbral effect produced by the sitar's sympathetic strings was similar to that of electronically produced guitar feedback. See "How about a tune on the old sitar?", *Melody Maker*, May 7, 1966, 10. The association between controlled feedback and Indian drones was not exclusive to popular music. The use of the technique by jazz guitarist Gabor Szabo, whose interest in Indian music was highly publicized, was also compared to a sitar. In a review of a Szabo performance at the 1967 Los Angeles Jazzfest, Eliot Tiegel wrote: "He wailed enthusiastically with the McFarland orchestra all three nights on 'Mountain Heir,' in which his solo was dominated by a sitarish effect, produced by his delicate fingering and turning his instrument toward his loudspeaker to create a high-pitched sound which he was able to control." See Eliot Tiegel, "Los Angeles Jazzfest Stars New Fraternity," *Billboard*, May 27, 1967, 12. It's worth noting, however, that Szabo's mimetic reference for the controlled feedback was the sustain offered by a trumpet, and not the sitar. See Eliot Tiegel, "Jazz Beat," *Billboard*, June 10, 1967, 12, 14.

But the droning quality of Beck's solo is not the only aspect of it that references Indian music. Indeed, the solo, which takes place over a shuttle between G- and F-major chords, is actually comprised of two separate tracks. As notated in figure 9, the first guitar sustains the pitches G and F, via feedback, in long note-values with some decorative embellishment. The second guitar, however, features rapid, highly ornamented figures that move stepwise throughout the G mixolydian mode.[83] But undoubtedly the dominant characteristic of this track is its movement in-between the fretted pitches, produced by Beck's frequent (and often quite large) string bends as well as his use of glissandi and vibrato. Taken together, Beck's articulations produce an effect redolent of the "vocal" quality that instrumentalists of the Hindustani tradition produce via *meend*, a gliding effect between pitches produced by lateral string deflection.[84] Furthermore, there is the distorted timbre of Beck's guitar. While there is much to distinguish the timbre of a sitar from that of a distorted guitar, both share a common richness of overtones. Indeed, the unique curved bridge of the sitar, its *jawari*, causes the instrument's strings, when plucked, to vibrate in a manner more akin to that of a bowed string instrument than that of a guitar. It is revealing, then, that in 1962, when Gibson began to market its Maestro Fuzztone ZF-1, one of the first distortion effect pedals on the market, it referenced the cello as a timbral analogue in its promotional copy in order to give prospective buyers some idea of what the novel

[83] Gerry Farrell has highlighted use of "modes which correspond to *thāts* or Indian scale types," especially those which feature non-functional usage of the flattened seventh scale degree, as one of the frequent surface-level features of Indian music to be incorporated into Western pop. See Farrell, *Indian Music in the West*, especially "Indian Elements in Popular Music and Jazz," 168-200.

[84] As Farrell notes, these techniques were already a part of the gestural vocabulary of British blues guitarists prior to vogue for the sitar. Indeed, these kinds of surface-level similarities between the language of Western popular music and that of Indian classical music helped to facilitate the "cross-over" between the two styles. See Farrell, *Indian Music and the West*, 179.

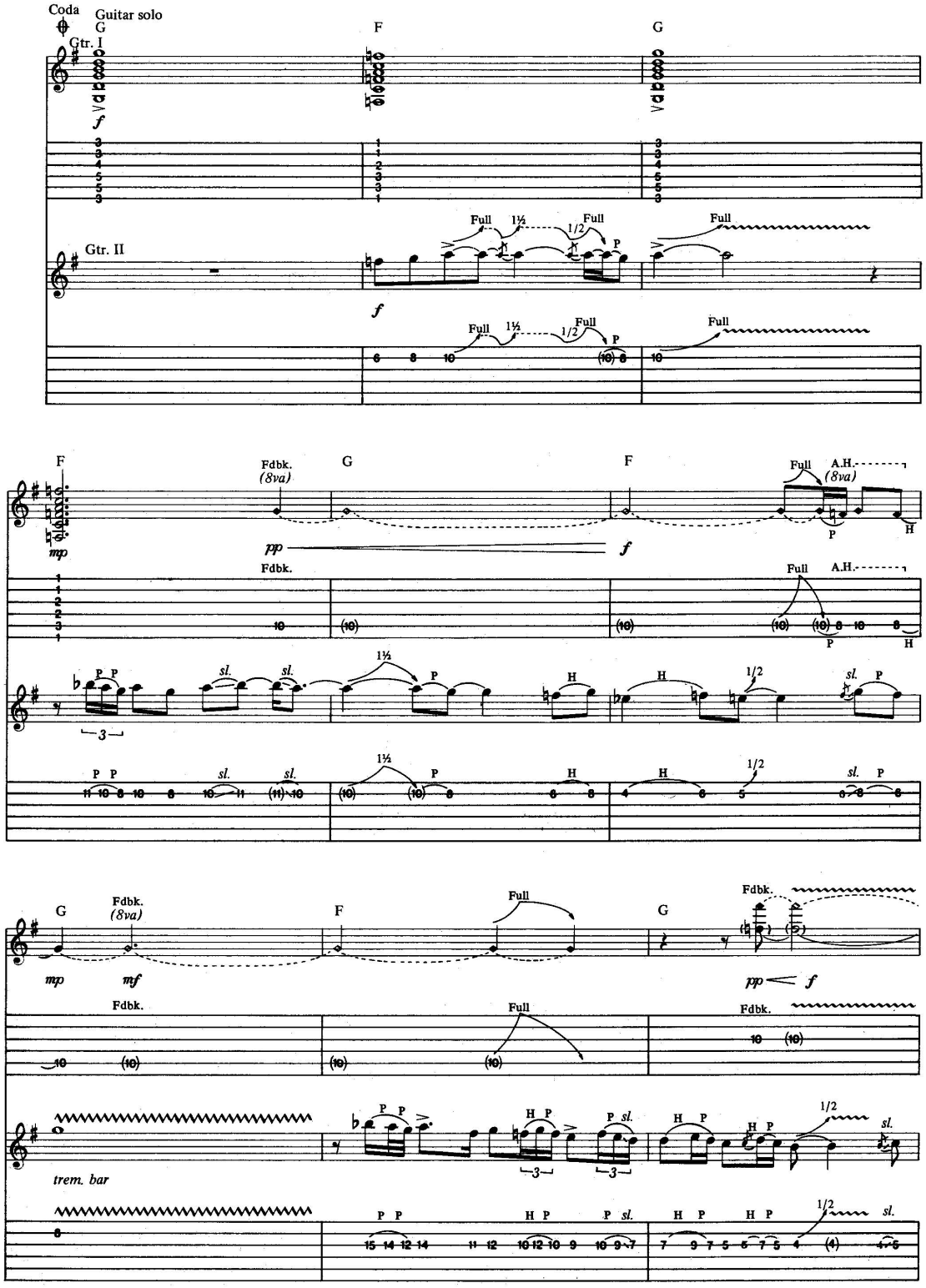

Figure 9. "Shapes of Things," guitar transcription.[85]

[85] "Shapes of Things," *Guitar for the Practicing Musician*, June 1992, 105-106.

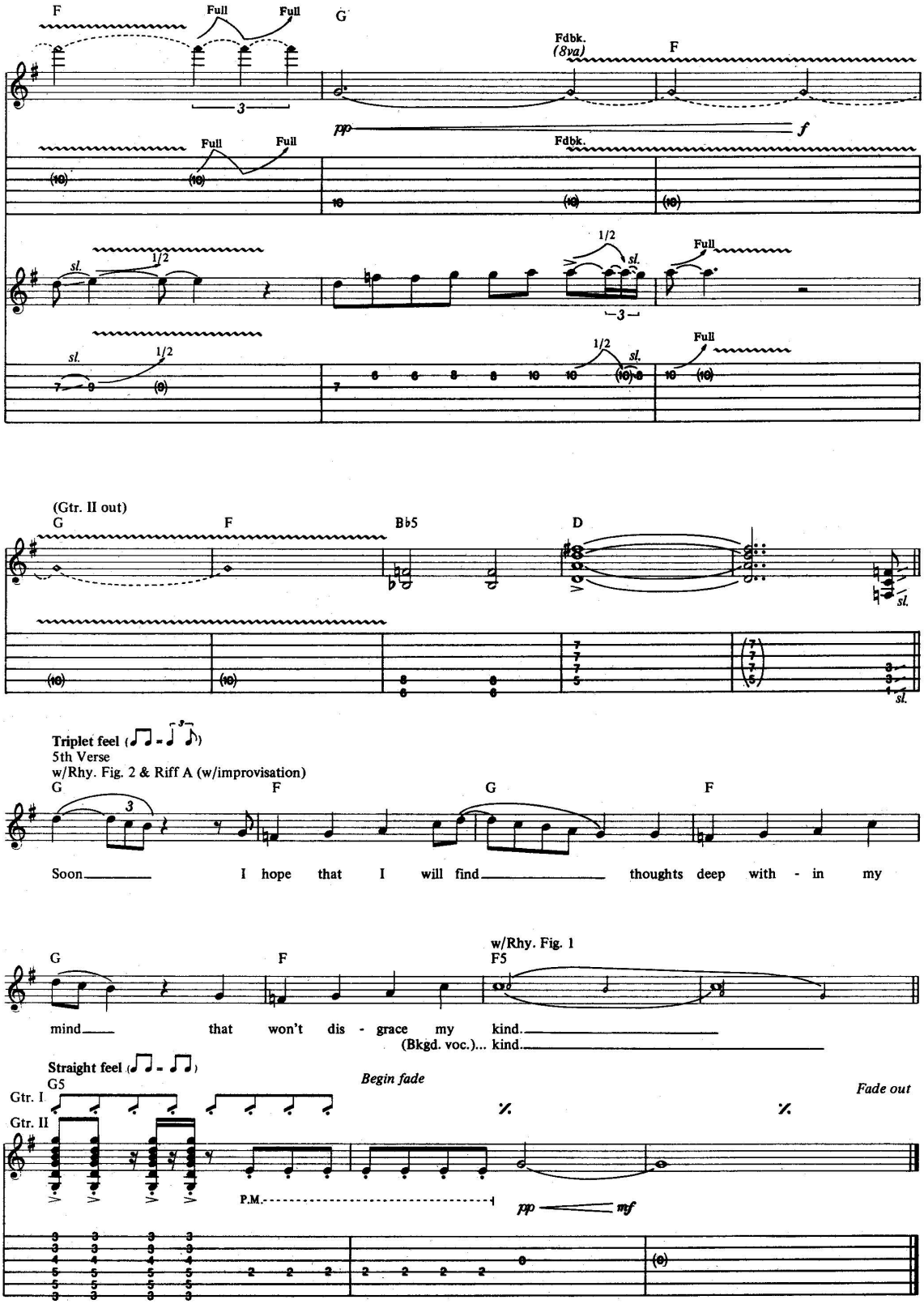

Figure 9, cont.

device actually did.[86] In 1965, when the Yardbirds were working on an earlier single, "Heart Full of Soul," their point of reference was the sitar. If Beck's distorted solo on "Shapes of Things" was thought to be evocative of the sitar, his similarly distorted lead riff on "Heart Full of Soul" was actually intended to be played by a pair of them; Jim McCarty, the Yardbirds' drummer at the time, has stated that the idea was scrapped when a suitable sound couldn't be achieved in the studio and, instead, "someone had the bright idea that Jeff could produce a sitar-like effect on the guitar, which he did."[87] In Michael Hicks' telling, it is above all the "overtone-rich" quality of Beck's guitar timbre, likely produced with a fuzz pedal built by Roger Mayer, a British audio engineer famous for his pioneering guitar fuzz effect pedals, that gives the part its "sitar-like effect."[88] "Shapes of Things," then, is an instructive example because it reveals the hidden complexity of any analogy drawn between two instruments. It is difficult to attribute the "sound" of an instrument to any one of its constituent parts. While the feedback drone in Beck's solo may have been the element of it that, perhaps simply by dint of its novelty, most captivated those who heard it, it also contained other elements that were "sitar-like," as well as some that were not.

Because the Yardbirds did not actually employ a sitar on either "Shape of Things" or "Heart Full of Soul," Beck's innovative guitar playing, as well as its reception, evinces a growing slippage between the beat scene's interest in the sitar and the *sound* of the sitar. Indeed, this slippage points toward a discursive shift focused on experimentation with sound that would fully emerge by the fall of '66. *Melody Maker*'s reviews of the Rolling Stone's April 1966 album

[86] Michael Hicks, *Sixties Rock: Garage, Psychedelic, and Other Satisfactions* (Urbana and Chicago: University of Illinois Press, 1999), 18. Vox used a similar approach in 1967 when marketing their then-new wah wah pedal; their advertising copy makes reference to the sitar, then a popular instrument, as one of its possible affective and imitative uses: "An electric guitar can growl or sound like a sitar with the use of the Vox distortion booster. And, it can imitate the sound of an on-and-off muted trumpet for groovier blues." See "Vox Creates Effects Pedal for Amplifiers," *Billboard*, March 28, 1967, 63.
[87] John Platt, Chris Dreja, and Jim McCarty, *Yardbirds* (London: Sidgwick & Jackson, 1983), 55.
[88] Hicks, *Sixties Rock*, 18-19.

Aftermath, as well as the chart-topping single that followed it, "Paint It, Black," emphasize this trend.[89] "Stones go wild on new sounds," the magazine reported:

> Undoubtedly this is the best they have made.… With the aid of dulcimers, sitar, organ, harpsichord, marimbas, fuzz boxes and the like, the Stones incorporate an overwhelming variety of atmospherics and tones.… 'Aftermath' should effortlessly take Britain by storm.[90]

The magazine also championed "Paint It, Black" with the laudatory headline, "Stones' raga-rocker most original yet." It continued:

> With Charlie's driving tom tom drumming, a sitar sound, and Mick's special Indian lament voice, it adds up to the most original and at the same time, humorous single the Stones have ever recorded.[91]

In retrospect, it's easy to see a certain irony in the title "Aftermath." While the search for new sounds would continue to dominate the production of popular music for years to come, "Paint, It Black" would be one of the last British singles to be evaluated positively simply by virtue of its incorporation of "Indian" sounds.[92] At the beginning of May 1966, just after the UK

[89] "Paint It, Black" was not included on the original April 15, 1966 UK release of *Aftermath*. The song was included, however, on the US release of June 1966.
[90] "Stones go wild on new sounds," *Melody Maker*, April 16, 1966, 11.
[91] "Stones' raga-rocker most original yet," *Melody Maker*, May 15, 1966, 13.
[92] It's striking to observe the extent to which the sitar could dominate discussion of a track that a music critic did not enjoy. A scathing review of Adam Mike & Tim's "A Most Peculiar Man" portended the kind of wry language that would be used by the music weeklies to parody the sitar's vogue later in the summer: "That's a senator isn't it? What that thing called—a sitar? It was used effectively on 'Norwegian Wood', and it's not being used effectively on this. This isn't the Byrds by any chance, because I understand they are using one? I thought they might have a bad one.

release of *Aftermath*, the American magazine *Variety* diagnosed the sitar as "Probably the most dominant influence on British pop music at the moment.… It's getting to the point where no group will go to the recording studio without one."[93] At this point, some British pop musicians had begun to perceive the search for new sounds as excessive, working contrariwise to the purpose of popular music. Indeed, in an interview published in *New Musical Express* the day of *Aftermath*'s release, John Dymond, better known as "Beaky," of Dave Dee, Dozy, Beaky, Mick & Tich, lamented, "We want pop kept pop. There are far too many people making pop complicated. We've no time at all for this 'in' talk about sitar music."[94] Crucially, Beaky's protestation elides two separate trends in popular music: the focus on "sounds," generally, and an interest in Indian music and the sitar, specifically. And, in so doing, he makes the sitar stand in as a symbol of the whole enterprise of pursuing novel sounds in pop.

Beaky's statement also articulates the sitar as something exclusive, the subject of an insider discourse. This position was corroborated by Jimmy Page, who opined in the pages of *Melody Maker*, "I think at the moment it's rather a status thing. A lot of people say they've got sitars and they sit together and have sessions, but as yet nobody has produced any evidence." But while Beaky felt that the sitar didn't belong in British pop, Page, by contrast, claiming to have

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This doesn't knock me out, but it's not hateful. There might be some possibilities there." In effect, we are told nothing about the song except that it makes poor use of a sitar. See John Walker, "Blind Date: John Walker reviews new pop singles," *Melody Maker*, April 30, 1966, 8.

[93] "Beatsville in Spin as Sitar Becomes 'In' Instrument on British Pop Scene," *Variety*, May 4, 1966, 195.

[94] "'In Crowds' don't exist, say Dave Dee, Dozy, etc," *New Musical Express*, April 15, 1966, 8. This sentiment was echoed in *Melody* Maker the following week by his bandmate David John Harman (Dave Dee): "It's true that some groups have got too clever and what they are playing has ceased to be pop music.… The kids don't give a damn about [the sitar and Indian music]. I think this Indian music that everyone's talking about is a load of nothing." See "Funny Thing—TV," *Melody Maker*, April 23, 1966, 9. The April 23, 1966 issue of *Melody Maker* also contained an edition of their "Pop Think In" feature with Brian Jones, who played the sitar on "Paint It, Black." When asked about the instrument, he responded: "I love the instrument—it gives a new range if you use an instrument like that. It has completely different principles from the guitar and opens up new fields for a group, in harmonics and everything." Taken together, Dave Dee and Brian Jones' attitudes demonstrate the wide range of opinion on the subject. See "Pop Think In: Brian Jones," *Melody Maker*, April 23, 1966, 9.

been the first to have a sitar in England, critiqued what he perceived to be superficial usage of the instrument:

> Probably everybody will end up playing them like guitars—that's all they want. Sometimes the sitar will be used well, other times it won't. It depends if they use them with taste. Like Harrison's thing. He could have got the same sound out of a banjo—but he showed more taste using a sitar.[95]

Page's comment proffers a number of insights. First of all, the sitar could function as a signifier of status and taste. If Page is correct in his claim that the same sound could have been produced with another instrument, such as a banjo, then when he refers to the "sitar" he must be invoking the instrument's physical form and, we might assume, the cultural associations that have accrued to it. Indeed, the physical construction of the sitar had, since at least the late 1950s, struck critics by dint of its apparent complexity and had been described variously as "a kind of three-in-one super guitar" and "an elaborate and complicated looking stringed instrument."[96] The perceived complexity of the sitar was corroborated by assessment of the music played with it, as well. In a 1957 *Billboard* review of Ravi Shankar's *Music of India, Vol. 2*, for example, the reviewer identifies the audience for the record as "highly sophisticated or ethnic-minded."[97] While "ethnic" music from around the world had long been marketed to émigré communities,

[95] "How about a tune on the old sitar?".
[96] The first quotation comes from Robert J. Landry, "Ravi Shankar Trio from India Presents a 'Bash'; Amusing & Amazing Music," *Variety*, October 11, 1961, 2. The second appears in "Album Reviews," *Billboard Music Week*, November 3, 1962. The earliest reference to the form of the sitar known to me comes from a review of a Ravi Shankar performance from 1958: "Ravi Shankar himself, on the involved-looking sitar with its vast array of strings running both over and under the frets, is more difficult for a Westerner to assess on points of technique, although the emotional impact of his playing is undeniable." See "Stimulating Indian Music," *L G S. The Stage*, October 9, 1958, 15.
[97] "Review and Ratings of New Albums," *Billboard*, May 6, 1957, 34, 40-41.

such releases were not often touted as "highly sophisticated." Yet it speaks directly to the contexts in which this music would have been encountered in the West in the 1950s. Indeed, the first formal recital of Hindustani classical music in the West, which featured the sarod player Ustad Ali Akbar Khan, occurred under the auspice of Yehudi Menuhin, a world-renowned violinist who would later collaborate with Shankar himself. While this chapter in the history of the sitar in the West is beyond the scope of this work—and has been elucidated elsewhere—suffice it to say that the sitar carried with it associations of high-brow culture and sophistication when it entered the domain of Western popular music.[98]

There is another insight lurking in Page's comment. While he is careful to avoid labeling Harrison's sitar line on "Norwegian Wood" as "inauthentic," he does hint at a dichotomy between using the sitar as a kind of timbral "effect," especially as a guitar-like effect, and using the instrument with reference to the formal and stylistic features of the musical tradition from which it came. This dichotomy proved to have a decisive impact on how critics, musicians, and fans evaluated popular music that featured the sitar. Depending upon where an instance of sitar-usage fell between those two poles, the group responsible for it might accrue—or, by contrast, lose—cultural capital by demonstrating their "insider" knowledge of Indian music. The singer Paul Jones, for example, lambasted superficial usage of the instrument and championed what he perceived to be deeper knowledge of its musico-cultural context:

> Our trumpet player, Henry Lowther, knows about Indian music, and knows that an interval of a 4th means a sun rise, in successive ragas. He can recognise that. But these

[98] See Peter Lavezzoli, *The Dawn of Indian Music in the West: Bhairavi* (New York; London: Continuum, 2006), especially 43-64.

> blokes making hits aren't interested in anything but making hits. It's like a fuzzbox to them—another sound, not a music form.[99]

While releasing records that made tasteful use of the sitar could have important social and professional consequences for a musician or group, so too could merely saying the right things in the music weeklies. In the June 4, 1966 issue of *Melody Maker,* Steve Marriott wittily expressed his frustration concerning the over-saturation of the sitar, complaining, “It's all over-blown and inflated.… We'll be able to get plastic sitars in our cornflakes soon. If it doesn't let up, the same will happen to Indian music that happened to folk.”[100] The following week singer Tom Jones was asked about his thoughts on the instrument, to which he responded, “I nearly died laughing when I read Steve Marriott's ‘Pop Think In’ and he said we'll be able to get sitars in our cornflakes! It's so true! It'll never take the place of the guitar.”[101] While his comments, which also included humorless riffs against Bob Dylan and Frank Sinatra, might seem innocuous enough, they ruffled the feathers of reader Deirdre Franklin, who wrote a short letter that was reprinted in the magazine:

> My blood is near boiling point having read Tom Jones’ Pop Think In.… Sitar playing is too far above his head, and the lack of appreciation for the talents of Bob Dylan and Frank Sinatra only convinces me an operation on his head might have been more use than on his tonsils.[102]

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[99] “Pop Think In: Paul Jones,” *Melody Maker*, June 25, 1966, 7.
[100] “Steve Marriott: We’ll be able to get plastic sitars in our cornflakes soon,” *Melody Maker*, June 4, 1966, 19.
[101] “Pop Think In: Tom Jones,” *Melody Maker*, June 11, 1966, 7.
[102] “Tom Starts Sparks Flying,” *Melody Maker*, June 25, 1966, 16. Franklin’s comment references Jones’ tonsillectomy of April 12, 1966.

Her comment illustrates that an appreciation of the sitar was part of a network of other cultural references that spoke to good taste. While Marriott's critique of the sitar possessed some wit, Jones comes across as vapid, casually dismissing figures more established than he without a sufficiently developed rationale for doing so.[103]

If I have not yet sufficiently made a case for the importance of the British music weeklies as a platform for musicians to influence public perception about themselves—a process in which the sitar played a decisive role at this time—then one more example will hopefully clear the air. Six weeks after Beaky's negative comments about the increasing complexity of popular music, during which the pages of *Melody Maker* and *New Musical Express* were laden with musicians opining about the sitar, Mick Jagger had this to say about "Paint It, Black":

> It was just one big joke… And we just stuck the sitar in because some geezer came in. He was in a jazz group and playing sitar in his pyjamas [sic]. And we said "Oh that'll sound good because it's got this thing that goes g-doing, doing, doing, etc."[104]

Mark Brend has argued that the "geezer" mentioned by Jagger in this quote is none other than Harihar Rao, an Indian sitar player teaching at UCLA and playing with Don Ellis'

[103] By the same token, fans could also be highly critical of musicians who came across as pretentious by bragging about (and perhaps exaggerating) their expertise with the instrument. The Scottish musician Donovan, for example, prominently featured the sitar during a US tour in early 1966 in support of his sitar-laden album *Sunshine Superman*. When asked by *Melody Maker* about the instrument's newfound popularity, he responded, "I started on sitar about six months ago, but I may finish with it now." His ready abandonment of the instrument lead one dissatisfied reader to comment: "I was pleased to read that Donovan with his usual artistic integrity, 'really got into the sitar' during the six months he has played it. He shows up Ravi Shankar—it's taken him a lifetime. Perhaps in the near future Donovan will take an hour or two off to 'get into' the guitar, harmonica, singing, writing music and lyrics and maybe even a combine harvester." See Bob Dawbarn, "Donovan: Now for the comeback," *Melody Maker*, June 4, 1966, 3; and "Mail Bag: Speedy Donovan," *Melody Maker*, June 18, 1966, 20.

[104] Jack Hutton, "Mick Jagger," *Melody Maker*, May 28, 1966, 10, 11.

Hindustani Jazz Sextet.[105] While this may be true, there seems to be something subtler taking place in Jagger's telling of the story. Although it is well documented that Brian Jones played the sitar part on "Paint It, Black," Jagger's implication seems to be that the "geezer" was actually responsible for it. Throughout the interview from which this passage comes, Jagger continually stresses the unstructured and jocular character of the recording session for "Paint It, Black." That is, they added the sitar part only because someone who played it happened to stumble into the session. The Rolling Stones were very conscious of the music weeklies as a site where they could construct an image of themselves through speech by exploiting the artificiality of the medium. Coming, as this piece did, after several weeks of intense bickering about the sitar in the papers, it is conceivable that Jagger wished to distance himself from the instrument—which the Stones were being lauded for using—by articulating "Paint It, Black" as a joke. If the sitar, in English culture, belonged in to a web of cultural references characterized by taste and sophistication, there can be no doubt that, were Jagger to express any genuine interest in the instrument, it would conflict with the "bad boy" image that he and the weeklies had cooperatively constructed for the group.[106]

By the end of England's fascination with the sitar, it was only George Harrison whose usage of the instrument retained any appreciable critical acceptance. When *Revolver* was released in August of 1966, the critics responded favorably to the Harrison-penned "Love You To." One critic, in language clearly sensitive to the cultural debate surrounding the sitar, judged, "the freedom is not abused… George goes the whole Indian hog. Virtually straight Indian sound,

[105] Mark Brend, *Strange Sounds: Offbeat Instruments and Sonic Experiments in Pop* (San Francisco: Backbeat Books, 2005), 151.
[106] For more on the artificiality of the Rolling Stones' "bad boy" image and the role played by the British music weeklies in constructing it, see "The British Art School Blues," in *The Pop Rock and Soul Reader*, third edition, ed. David Brackett, 219-24 (New York; Oxford: Oxford University Press, 2014).

complete with tabla drummer, and tremendous sitar part by George."[107] While no doubt the most sophisticated attempt to fuse the idiom of Western popular and Indian classical musics released until then, Gerry Farrell's analysis of Harrison's use of structural devices borrowed from Indian music in "Love You To" reveals the true extent of the hyperbole in this assessment.[108] But if "Love You To" wasn't exactly "whole Indian hog," it nonetheless constituted a kind of zenith for the British beat milieu's engagement with Indian music.

A month later, on September 17, 1966, *Melody Maker* would note, "The pop world's flirtation with Indian sounds and particularly the sitar seems to be slowing up."[109] While the sitar would continue to linger on in England for a time yet, especially in Harrison's work with the Beatles, its heyday had certainly passed. In the end, British musicians had never really been able to escape thinking about the sitar through their guitars and were increasingly conscious that professional longevity necessitated fresh sonic discoveries. The dominant discourse had thus shifted its focus from the sitar to the much more general category of "sound," which provided a context for the many diverse experiments in pop taking place by the end of the year. But the sitar, while it continued to play a role in new genealogies of popular music and sonic experimentation, was no longer the star. Nonetheless, as the buzz of sitars throughout England abated, ears across the Atlantic were just starting to perk up.

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[107] "Beatles Break the Bounds of Pop," *Melody Maker*, July 30, 1966, 3.
[108] For Farrell's analysis of "Love You To" see Farrell, "Indian Elements in Popular Music and Jazz," in *Indian Music in the West*, especially 179-188. Beginning with David Reck's favorable analysis of "Love You To" as a kind of compressed performance of a *rāg*, Farrell recognizes that "Love You To," as well as *Sgt. Pepper*'s "Within You, Without You," represents a "patchwork of Indian musical styles and techniques." Nonetheless, Farrell is quick to note that creating an "authentic" piece of Indian music was never Harrison's intention and recognizes his genuine appreciation for that musical style.
[109] "Experiments with sounds."

2.6: "Pop Goes the (Electric) Sitar": America

"I am frightened that people who don't really understand the sitar will cash in on the sudden interest in it here."[110]

— Ravi Shankar

"You Don't Have to be Hindu to Play the Sitar."

— promotional copy for the Coral Electric Sitar

While the relative merits of the sitar's use in western popular music were being debated in England, the American music industry was busy taking note. British musicians had already sparked a massive consumer interest in electrified music instruments, especially amongst youths, at the outset of the so-called "British Invasion" and American instrument manufacturers and retailers were paying close attention to changing trends in instrumentation with the hopes of bolstering their business. But selling sitars was no mean task; although sitars were already available in England prior even to the release of "Norwegian Wood," the instrument was not easily available through the distribution channels open to retailers in the United States.[111] But American instrument dealers became interested in selling sitars by the fall of 1966 and, while sales of the sitar would never reach a volume even remotely comparable with the electric guitar, the industry's gold standard in the mid-1960s, they nonetheless surpassed all expectations.[112] Unburdened by the sitar's waning cachet in England, popular musicians continued to serve as

[110] Bob Houston, "Ravi Shankar: doubts about East ever meeting West," *Melody Maker*, June 11, 1966, 6.
[111] While high quality instruments were more difficult to acquire, import shops like London's Indiacraft, where Harrison purchased the instrument used on "Norwegian Wood," or Oriental Arts had basic instruments available for between £30 and £35. See "Expert Advice," *Melody Maker*, June 18, 1966, 16.
[112] "With Guitars, Amps, It's Christmas All Year Long," *Billboard*, November 26, 1966, 79-80.

tastemakers in the United States and stimulated sales of the instrument by featuring it on their recordings.[113] George Harrison was, of course, especially important in this regard, as dealers reportedly stocked the instrument upon hearing of his trip to India in the fall of 1966 to study it.[114] Indeed, the late surge in retail interest in the sitar in fall of 1966, which would last until the summer of 1967, speaks to how out of step the English and American music markets could be even during a period of such close intertwining.

Beyond the endorsement of a popular musician, sitar sales were also stimulated by the publication of sheet music for the instrument. Given that the repertory and technique of Hindustani classical music is principally transmitted orally between master and student, published texts on the subject were oriented principally toward outsiders, especially players of other instruments. As such, they served a second function as advertisements for the instrument itself. Guitarists served as the major market for such texts, and—given the perceived, if fundamentally superficial, similarities between the two instruments—dealers hoped that their interest might ultimately lead to the sale of an instrument, which it occasionally did.[115] While a sheet music folio might retail for a meager $2.50, a sitar in the US could retail for hundreds of dollars, netting dealers a substantial profit. In tandem, publishing companies like Peer-Southern used sitar giveaways as promotional tactics to sell copies of their product, producing a symbiotic relationship between themselves and instrument dealers.[116]

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[113] It's worth noting, too, that the field of instrument retail was expanding at this time as well. One of the major shifts seen over the course of 1966 was the increased competition presented by discount stores to record retailers, especially independent ones. While many disk retailers became more service-oriented, seeking to offer customers a comprehensive relationship that discount stores couldn't, many of them also branched out into new product lines, including musical instruments, generally, and sometimes the sitar, specifically. See "Disk Dealers Hit Non-Record Jackpot," *Billboard*, January 28, 1967, 38.

[114] "Sitar Sales Soar in Folios, Instruments," *Billboard*, August 5, 1967, 1, 16.

[115] "Sitar Sales Soar in Folios, Instruments."

[116] Hank Fox, "Middle East's Music Playing Hot Chart Role," *Billboard*, November 19, 1966, 1, 13. Peer-Southern, at this time, were especially interested in tapping the writing talent available in a number of foreign markets, especially those around the Middle East. They also sponsored at least one East-meets-West collaboration between

While the vast majority of England's popular musicians had given up on the sitar by the fall of 1966, American interest at the time was, in the words of World Pacific's Dick Bock, "snowballing." But, in a remarkable reversal, most of the records touted in the pages of *Billboard* and *Variety* for their usage of the sitar were not those of popular musicians looking to incorporate the instrument into their own idiom as the English had just months prior. Rather, they were recordings by trained sitar players like Ravi Shankar and Harihar Rao. Indeed, toward the end of 1966, Bock's record label had launched several disks featuring Asian musicians and, in a pronounced about-face, cited the sitar-endorsement of British musicians like the Beatles, the Yardbirds, and the Hollies as a promotional pitch.[117] It was Shankar, by all accounts, who received the vast majority of these honors, frequently being cited as an influence on popular music and jazz in reviews of his records as well as being awarded *Billboard*'s "Artist of the Year" award at the end of 1967 for his influence across genres.[118]

But while the sitar's popularity in the United States was soaring, many of its newfound adherents lamented what they perceived to be the instrument's many impracticalities: its size, fragility, complexity, low volume, and cost. Indeed, while the sitar was well suited to the controlled environment of the recording studio, many musicians found it a poor match to the strains of touring and the idiosyncrasies of the era's lackluster sound reinforcement. Furthermore, and perhaps most importantly, few popular musicians had available the time necessary to develop sufficient technique on the instrument, let alone to "master" it. Perhaps, then, the most

country guitarist Chet Atkins and sitar-player Harihar Rao, the latter of whom was a Peer writer. See "Peer-Southern Taps Middle East," *Billboard*, December 31, 1966, 6.

[117] "India's Rhythm Captures World Pacific; 5 LP's Out," *Billboard*, December 17, 1966, 4. World Pacific was, at this time, also promoting work that extended beyond the sitar vogue, including that of the Japanese koto player Kinichi Nakanoshima, the Indian veena player Sundaram Balachander, as well as the Carnatic vocalist Madurai Shanmukhavadivu Subbulakshmi.

[118] See, for example, the review of Shankar's *Ravi Shankar in New York* in "Album Reviews," *Billboard*, April 15, 1967, 36, 38, 80, or the review of *Two Raga Moods* in "Album Reviews," *Billboard*, August 19, 1967, 45, 47-48, 55, 80.

striking development over the course of the American infatuation with the sitar was the design and manufacture of commercial products that were intended to abstract the instrument's sound from its physical form and provide players with other means of accessing it.

Chief among these was a category of instruments marketed as "electric sitars." While such instruments were already being forecast in the summer of 1966, the first, produced by the Danelectro guitar firm for its Coral brand, was not commercially available until May of 1967.[119] New York-based session guitarist Vincent Bell developed the instrument in collaboration with Nathan Daniel of Danelectro.[120] Intended to tap into the large market of guitarists interested in the sitar, yet wary of the time commitment and cost required, the Coral electric sitar's advertising copy repeatedly emphasized its similarity to the guitar in all aspects except sound. One advertisement, featured in *Billboard*, explained: "The Coral Sitar has the same neck, same action, same play strings as a guitar... BUT THE SOUND IS SOMETHING ELSE."[121] Another, which ran in *The Village Voice*, made the pitch even more explicit: "The Sitar sound can be played by anyone who plays an electric guitar."[122] Indeed, for all intents and purposes, the Coral electric sitar was an electric guitar with two timbral modifications: the substitution of a flat "buzz"

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[119] As Richard R. Lingeman wrote in a lengthy *New York Times* editorial about the emergent psychedelic culture, "An electric sitar is already in the works for American groups, many of whom think that raga rock is the coming sound." See Richard R. Lingeman, "Offerings at the Psychedelicatessen," *New York Times*, July 10, 1966, 182. For information about the release of the Coral electric sitar, see "Danelectro Introduces Electric Indian Sitar," *Billboard*, May 13, 1967, 62. The Coral electric sitar also remains the best known of this genre of instrument. Indeed, a slew of companies including Rogue and Jerry Jones Guitars, have copied the Coral design, right down to its idiosyncratic "crackle" finish. But, while electric sitars were novelties in the United States in 1966, they had apparently long been in usage in India. As Ravi Shankar reported to the *New York Times*: "We've had electric sitars in India for 20 years. They're all right for light music. Somebody gave me one a long time ago. I tried it once. It's been lying around somewhere since." See Theodore Strongin, "Now Indian Sitar Can be Turned on: Instrument is Electrified for Rock 'n' Roll Groups," *New York Times*, November 4, 1967, 37.

[120] Bell assisted in the design of a number of Danelectro and Coral instruments, including an electric bouzouki called the "Bellzouki."

[121] This advertisement ran in *Billboard* between March 30 and July 6, 1968 and featured a number of stylistically diverse guitarists including Gabor Szabo, Dennis Larden (Every Mother's Son), Tom Dawes (The Cyrkle), Al Nichol (The Turtles), Richie Havens, Bugsy Maugh (Butterfield Blues), Charlie Beal (The Paupers), and Frank Valli (The Four Seasons).

[122] *The Village Voice*, February 13, 1968, 17.

bridge and a set of thirteen sympathetic strings. The instrument was even purported to be an improvement over the sitar because it enabled players to achieve that instrument's sound while being able to both play chords and melody, a feature for which, of course, there is no expressed need in Hindustani classical music.[123]

If the Coral electric sitar had the look and feel of a guitar but the sound of a sitar, the Rajah Zeetar sought to at least reclaim the look of the Indian instrument. The Zeetar featured a papier-mâché body designed to emulate the sitar's distinctive gourd resonator, replete with leaf ornamentation, and a convincing recreation of the sitar's long neck and tuning pegs. In addition to the electronics—which offered a stereo output, an unusual feature with which other instrument manufacturers like Musicraft were beginning to experiment in 1967—the Zeetar featured strings and frets that, in the words of Sidney Solomon, the instrument's inventor, were "exactly like those of a guitar and easily played by anyone familiar with the guitar."[124] But, if the Zeetar and Coral electric sitars differed cosmetically, their forms spoke to a similar concern with ensuring that the instrument would be immediately playable by guitarists, who were their primary market. And, with both instruments priced at about $300, comparable to a good-quality electric guitar, the financial burden was less staggering than a high-end sitar. The impetus spurring the Danelectro and Rajah firms' designs was perhaps best encapsulated by Dennis Larden, guitarist with Every Mother's Son, when he told Theodore Strongin: "I have only one lifetime and I could waste three incarnations just learning [the sitar]."[125]

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[123] In practice, however, the flat bridges used on the Coral electric sitars tended to cause significant intonation problems, which were highlighted by chordal playing.

[124] Amy Lee, "Zeetar makes the scene; a glossary of Indian instruments: North Indian instruments," *The Christian Science Monitor*, August 23, 1968, 6. In the months leading up to the 1967 National Association of Music Merchants trade show, when many music manufacturers were unveiling new products with "far-out" features, Musicraft released a "stereophonic" guitar called the Messenger. See "Musicraft Creates New Guitar Neck," *Billboard*, May 13, 1967, 62.

[125] Strongin, "Now Indian Sitar Can be Turned on."

As evinced by the attention that the Coral and Rajah instruments garnered at NAMM's 1967 Music Show, dealers were excited about electric sitars. Following the 1966 Music Show's focus on the record sales and sales potential of electric guitars, the '67 show's exhibition space was dominated by manufacturers with novel variations on the instrument. Guitars forged into novel shapes (Hallmark's "swept wing" guitars), out of novel materials (Ovation's "lyrachord" guitars), and with novel features (Musicraft's "stereophonic" Messenger guitar) were all of great interest to instrument dealers, many of whom were just entering the business after reports of the previous year's stellar sales figures.[126] In this context, it is easy to see how the electric sitars, with their guitar-like feel, could reinforce the idea, first encountered in the British music weeklies, that the sitar's role in Western popular music was that of a special "kind" of guitar or exotic guitar "effect" rather than an instrument with its own tradition, repertoire, and techniques. Bell himself brilliantly exhibited this by using the Coral electric sitar as an exotic effect on a Decca album he released to promote the instrument in 1968: "Pop Goes the Electric Sitar." The album, a collection of exotica-tinged easy listening instrumentals of contemporary pop hits like "Eleanor Rigby" and soundtrack items like "Lara's Theme" from *Dr. Zhivago*, makes little pretense toward authenticity.[127]

While dealers received the electric sitar positively, some cultural critics were highly disparaging of it. Longtime music critic for *The New York Times*, Theodore Strongin, wrote a rather negative piece surveying the genesis and usage of the Coral electric sitar, concluding, "It

[126] The 1967 music show also offered a number of seminars to help dealers sell instruments, including one specifically for selling the guitar entitled "The Guitar Today and Tomorrow." See "Music Show Exhibits Feature Instruments, Tape Cartridges," *Billboard*, June 17, 1967, 55.

[127] While one of the first, and probably only, records to so overtly feature the electric sitar as an ear-catching timbre to market a collection of new arrangements of popular songs, the sitar had already been used toward such ends. Chim Kothari's 1967 *Sound of Sitar*, for example, features covers of pop hits like "Winchester Cathedral" and "Eleanor Rigby." It is not unheard of for musicians from northern India's classical tradition to find themselves collaborating with artists from the realm of western popular culture. This topic is explored with regard to Inayat Khan, Rabindranath Tagore, and Uday Shankar in chapter five of Farrell, *Indian Music in the West*.

can make a variety of sounds, but its principal contribution is the powdery, plinky effect made famous by the Beatle, George Harrison."[128] But the most damning criticism came from Richard Goldstein, a critic for a variety of culturally high-minded publications, including *The Village Voice* and *Vogue*, who belonged to the generation whose music he wrote about.[129] Framing it under the heading "WARNINGS OF THE WEEK," Goldstein broached the electric sitar in his *Village Voice* Pop Eye column, writing:

> Instant quick fix, flash frozen, spasm culture. Now, you can play the sitar in less time than it takes Ravi Shankar to get up in the morning.… So drop out of that silly ethnic-folky karma, and come in, in, alltheway IN with the plug-in Nirvana of the gunja-generation.[130]

If the electric sitar's ease had previously been one of its major selling points, here, in Goldstein's commentary, it becomes the cause of great consternation. It is easy to imagine how the electric sitar could function as the ultimate signifier of psychedelia, fusing together, as it does, the timbre of an instrument from India—a nation whose musical and spiritual practices were heavily drawn upon by the beatniks and hippies—with electrification—a process that Michael Hicks has identified as being integral to psychedelic music.[131] But, in Goldstein's writing, it assumes another, more sinister layer of meaning. The phrases with which he opens his critique suggest

[128] Strongin, "Now Indian Sitar Can be Turned on."
[129] For information regarding Richard Goldstein and the emergence of a distinctive style "rock" music criticism, see David Bracket, ed., *The Pop, Rock, and Soul Reader*, third edition (New York; Oxford: Oxford University Press, 2014), 214-17.
[130] Richard Goldstein, "Pop Eye: The Censors with the Fringe on Top," *The Village Voice*, May 25, 1967, 14.
[131] Hicks, recognizing that overuse of the term "psychedelic" has potentially stripped it of any meaning, identifies a tripartite scheme of dechronicization, depersonalization, and dynamization as constitutive of psychedelic music. He suggests that loud amplification and artificial reverberation are important catalysts for depersonalization, both of which are enabled by electrification. See Hicks, *Sixties Rock*, especially 63-67.

mass consumption and unnaturalness, elements of an increasingly materialist and technology-driven society that the counter-culture understood itself to be rebelling against. If, on the surface, the electric sitar seemed to fit naturally into the network of cultural references constellating around the counter-culture, Goldstein seems intent to remind us that the instrument is, ultimately, a fashionable entertainment object priced like a luxury good:

> But it was the Chicago riots, as much as Earth Opera, that killed the “psychedelic” sound. It just wasn't enough any more to hear your favorite British bluesman hustle his way through twelve groaning bars of Muddy Waters on an electric sitar. All those beads and bangles were remnants of a grand illusion; now that businessmen were wearing Nehru jackets—and hey, it didn't make them any more loving—it was time to swear off hip finery and bring on the old fatigues.[132]

Even before Altamont came to signal the “end of an era,” Goldstein found that the counter-culture’s signifiers were being stripped of their meaning as they entered the marketplace. For Thomas Frank, author of *The Conquest of Cool* (1997), this was the definitive feature of an era that touted consumerism as a remedy to itself:

> From its very beginnings down to the present, business dogged the counterculture with a fake counterculture, a commercial replica that seemed to ape its every move for the titillation of the TV-watching millions and the nation's corporate sponsors.[133]

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[132] Richard Goldstein, “Vogue’s Spotlight: Pop Music,” *Vogue*, June 1, 1969, 68.
[133] Thomas Frank, *The Conquest of Cool*: *Business Culture, Counterculture, and the Rise of Hip* (Chicago: University of Chicago Press, 1997), 7.

If Nehru jackets couldn’t make businessmen more loving, neither could, perhaps, electric sitars. Of course, they were never supposed to. Indeed, the cynical reading of this instrument’s purpose—perhaps best encapsulated by Coral’s own advertising pitch, quoted at the beginning of this section, “You Don’t Have to be Hindu to Play the Sitar”—was that it provided a means to avoid engaging another culture while still providing instant access to sounds that could evoke it. Shankar, himself, carried no reservations in his criticisms of the West’s flirtations with Indian culture. Indeed, he frequently emphasized the seriousness of the musical tradition in which he participated and expressed skepticism toward both popular and jazz musicians’ attempts to meaningfully engage Indian instruments and music. As he explained to *Melody Maker* at the height of the “great sitar explosion”: “Some of the younger musicians want to learn about Indian music, but the trouble is they haven't the time. They just want to take something superficial from it.”[134] In this respect, perhaps, the electric sitar is one of the most potent symbols of the failure that these two cultures experienced trying to dialogue with each other.

2.7: Conclusion: In Search of “Harpsichord-” and “Sitar-ness”

Over the course of this chapter we’ve looked at several instances where musicians and instrument manufacturers have attempted to provide access to the sound of the harpsichord and sitar through other means. For both instruments, this entailed either a). imagining a more robust instrument that could compete sonically with the rock instrumentarium or b). approximating the instrument’s distinctive timbre on another instrument altogether. In either case an opposition was

[134] As Shankar described it for *Melody Maker*: “Ours is a very disciplined music... really a classical tradition. It is also a philosophy and a way of expressing many emotions—not in a superficial way, but from inside us.” See Houston, “Ravi Shankar.”

presented between fidelity to a tonal ideal and practicality. This paradox is, perhaps, best summed up by Wolfgang Zuckermann in his description of a fundamental compromise built into the harpsichord:

> It does seem that the builder often has to make a choice whether to go for the best tone or the greatest amount of stability. That choice is not easily made, since an instrument with the most ideal tone will never get the chance to be heard at all if it is constantly out of tune and regulation.[135]

A similar assessment could be made, no doubt, concerning the huge variety of modern technologies that have enabled Western musicians to access to the sounds of the harpsichord and the sitar through a proliferation of means. As a quintessential keyboard sound, harpsichord-like timbres continue to be featured on electronic keyboards, synthesizers, and sample libraries. Some of these, such as Sonic Couture's Conservatory Collection allow access to (some of) the sounds of original eighteenth-century instruments without suffering the contingencies of barometric fluctuation or ageing. No doubt there are some gains to be found here with regard to stability, but the performer is, of course, thrust into an encounter with what might well be considered another instrument entirely—the sampler—and its attendant performance conventions, techniques, and so on.

Though less common, instrument manufacturers have also continued to produce variations on the design of so-called "electric sitars," especially in India. Firms like Mumbai's Bhargava & Co., for example, have experimented with electric flat-backed sitars amplified with pickups

[135] Zuckermann, *The Modern Harpsichord*, 49.

while others, such as G Rosul, have produced electric "fusion" sitars that merge the body and headstock of a solid-body electric guitar with the sitar's traditional *dandi*. Manufacturers have also produced new acoustic instruments meant to transfer some of the practical features of the various electric sitar designs back into the acoustic domain. The UK firm Pygmy, for example, produces an eight-stringed "sitar" whose form resembles that of a bouzouki. Instrument manufacturers have also used effects pedals as a means for providing guitarists with a "sitar-like" sound. If Beck's fuzz pedal was thought to produce something "sitar-like," then Danelectro's Sitar Swami and Electro-Harmonix's Ravish Sitar pedals make the agenda explicit. This logic has also manifested in the design of hybrid electric guitars with digital circuitry, such as the Line 6 Variax, which includes a sitar preset.

The plethora of technologies and techniques adumbrated here that could potentially yield a harpsichord- or sitar-like sound speak to these instruments' longstanding status as distinct timbral ideals or reference points, a kind of aural skeuomorph. Indeed, each of these diverse instruments supports imitation of the sound of the harpsichord or the sitar through the use of different materials and performance techniques. In this regard, we might think of the sound of these reference instruments as a kind of timbral capacity or affordance, potentially emerging from a vast multitude of component parts. In *The Design of Everyday Things*, Don Norman describes an affordance as "a relationship between the properties of an object and the capabilities of the agent that determine just how the object could possibly be used."[136] While the usage of any of these instruments in the manner of either a harpsichord or a sitar is not necessarily predetermined or prescribed by the objects themselves, titling them as such functions as what Norman would term a "signifier": "any mark or sound, any perceivable indicator that

[136] Don Norman, *The Design of Everyday Things*, revised and expanded edition (New York: Basic Books, 2013), 11.

communicates appropriate behavior to a person."[137] In each of these examples, by furnishing the user with an instrument capable of producing a harpsichord- or a sitar-like sound—though it may be only one of many possible uses of the instrument—and then pointing them toward this reference as its proper (or at least ideal) function, we come to comprehend how "harpsichordness" and "sitarness" have underpinned the design of a hugely diverse cadre of instrument technologies.

Nonetheless, does an instrument's capacity to produce a harpsichord- or sitar-like sound, or even its being named a "harpsichord" or a "sitar," make it one? Or, to take this question a step further, can one harpsichord-like instrument be more or less harpsichord-like than another? And can a sitar-like instrument be more or less sitar-like than another? Is the RMI Rock-Si-Chord, with its electronic tone-generating circuit, less of a harpsichord than the Baldwin electric, with its solid-body design? Is the guitar-like body of the Coral electric sitar somehow less sitar-like than the Rajah Zeetar, with its papier-mâché "gourd," even though both make use of guitar-like necks and fingerboards? Is Markowitz's electric harpsichord more harpsichord-like because it was intended for private use, whereas the Beach Boys took a Baldwin electric on tour?

These questions, of course, point to the subjectivity inherent in any judgment concerning imitation and authenticity. Indeed, while the use of electrical technologies to augment volume, convenience (with regard to tuning, for example), and durability have helped to adapt harpsichords and sitars to the rigors and strictures of contemporary popular music culture, they have also threatened to undermine their identity *as* harpsichords and sitars. The "amplified ancients" that I have examined in this chapter all violate the taxonomical criteria of their parent categories, yet nonetheless depend upon those very categories for their significance. But, rather

[137] Norman, *The Design of Everyday Things*, 14.

than dismiss their categorical belonging outright, perhaps a productive way forward is to, like Jerome Markowitz, acknowledge these diverse devices as "counter-instruments," a term that acknowledges the liminal space occupied by instruments that position themselves "as" other instruments while, by virtue of their construction, are often not understood to fully "be" what they lay claim to. Indeed, such counter-instruments might provide their users with a kind of symbolic affordance, entwining their practice in a vast and complex web of musical and cultural associations and concerns constellating around a single, ideal object.

Yet another way of understanding the divergences within a common category of instrument is through recourse to genre theory. Drawing upon an exchange between J. L. Austin and Jacques Derrida, David Brackett argues that musical genres function according to a principal of citation or iteration. As he writes:

> It is a condition of the legibility of a text that a listener can place it in the context of a genre, that is, in the context of how sounds, lyrics, images, performer personae, musical rhetoric, and a generic label (among other things) can be related. In order for this to occur, texts must cite or refer to generic conventions that predate them. A musical text that is not a literal quotation can only be understood as participating in a genre if that genre is capable of being quoted outside of, or beyond, the initial context in which it was created, and if that genre is legible to addressees beyond the initial audience for the genre.[138]

[138] David Brackett, *Categorizing Sound: Genre and Twentieth-Century Popular Music* (Oakland, CA: University of California Press, 2016), 13.

Like musical works, newly produced instruments typically refer to the conventions of instruments that predate them. And while musical genres are made manifest through interrelationships between a variety of factors including “sounds, lyrics, images” and so on, instruments are made manifest through the materials and components from with which they are constructed, the manner in which performers interface with them, the range of sounds they are capable of producing, the musical gestures that are idiomatic to their forms, and no doubt many other things. Though instruments are not typically conceptualized in terms of quotation, we can nonetheless see how two instances of the same type of musical instrument (such as a Fender Stratocaster and a Gibson Les Paul) participate in a common genre (guitar, or electric guitar) even though they are not carbon copies of each other. Indeed, the rich variation observed in the design of guitars over the instrument’s centuries-long history corroborates Brackett’s point that the quest for a genre’s origins is always a “constant act of deferral”; while the Spanish guitars of the sixteenth century and the B.C. Rich Warlock might strike a Renaissance observer as entirely different instruments, the generations of guitars produced in the interim—each participating in the (re)production of the guitar genre itself—has contributed to a gradual shift in our understanding of what a guitar fundamentally is.

But surely not all observers would agree. Andres Segovia would no doubt deride the Warlock, like the electric guitars of the 1960s, as an “abomination,” if not worse. Similarly, the comments of Wolfgang Zuckermann, Ruth Nurmi, and Ravi Shankar show that acceptance of the electric harpsichords and sitars as such was circumstantial, largely determined by one’s enculturation within the context of a particular musical genre. But, even so, many hearers in the 1960s *did* experience these “amplified ancients” as the instruments that they purported to be, a point that suggests that processes of citation are never monolithic. Rather, histories of musical

instruments, like genres of music, must attend to the divergences that emerge amongst publics who prioritize the constitutive elements of a given genre differently.

Since their emergence in the late 1960s, all of the instruments discussed in this chapter have fallen out of production. The electric sitars were hit hardest; both the Rajah and Danelectro firms were closed for business by the end of the decade. While RMI would remain in operation until the early 1980s, it would shift the focus of its production from the Rock-Si-Chord to its "electra-pianos," which proved popular amongst progressive rock groups like Genesis and Yes. Of all these firms, Baldwin remains the only one still standing, though its electric harpsichords have been out of production for many years.[139] But music instruments are dynamic and fluid technologies. Whatever the circumstances of their genesis and emergence, it is impossible to fully map out the trajectory of their social lives in advance. They are, as Ali Jihad Racy argues, "interactive entities," capable of engaging "dialectically" with their surroundings:

> Being both adaptive and idiosyncratic, [musical instruments] are not mere reflections of their cultural contexts, nor are they fixed organological artifacts that can be studied in isolation from other social and artistic domains. Instead, instruments interact dialectically with surrounding physical and cultural realities, and as such, they perpetually negotiate or renegotiate their roles, physical structures, performance modes, sound ideals, and symbolic meanings.[140]

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[139] Due to the regular wear incurred by the instrument's various components, especially its jack mechanism, Baldwin's lack of continued support for the instrument has made electric harpsichords of good condition incredibly difficult to find. Hendrik Broekman, current head of the Hubbard Harpsichords workshop and a one-time apprentice of Eric Herz, has outlined the challenge of maintaining a Baldwin electric harpsichord in a paper published on that company's website. See Hendrik Broekman, "Baldwin Electronic Harpsichord," Hubbard Harpsichords, November 8, 2008, accessed November 2, 2015, http://www.hubharp.com/pdf/Baldwin-small.pdf.

[140] Ali Jihad Racy, "A Dialectical Perspective on Musical Instruments: The East-Mediterranean Mijwiz," *Ethnomusicology* 38/1 (Winter 1994): 38.

Indeed, in recent years these four "amplified ancients" have negotiated a new lease on life through the aid of digital technologies and open-minded musicians. But while original instruments are no doubt hard to find, sampled versions of instruments like the RMI Rock-Si-Chord and the Baldwin electric harpsichord can now be accessed by anyone with a computer.[141] This is a notable extension of the separation between touch and sound broached earlier in the design of electric harpsichords, as the polymorphic sampler is a particularly good instrument technology for demonstrating how the sound and the interface of an instrument can become wildly decoupled.[142] Though they haven't yet become the subject of sample libraries, electric sitars, too, are experiencing something of a renaissance. While the original Coral instrument has long been out of production, a variety of other firms have produced models based on their original designs, including Rogue, Agile, and Jerry Jones. And if the instrument's sympathetic strings contributed little to its mimetic role, they have been fully exploited by a new generation of guitarists like Rob Mastrianni who, in a series of videos posted to his YouTube channel, treats the electric sitar as an instrument in its own right with its own, distinctive technical language. In this case we encounter musicians like Mastrianni performing not as guitarists or as sitarists but as *electric-sitarists* proper. Situated a temporal arm's-length from their original emergence, these instruments are now "vintage" and their "failure" to achieve their purported mimetic goals—a

[141] A virtual, sample-based Rock-Si-Chord instrument for Native Instrument's Kontakt player is available for free from Sonic Couture, a firm specializing in samples of unique and unusual instruments. A set of samples for the Baldwin electric harpsichord is available via Antiquity Music.

[142] This is, perhaps, nowhere clearer than in the current working methods of many composers who supply soundtracks for films, television shows, and commercials. As recording budgets tighten, many composers are producing orchestral recordings with sample libraries rather than a live ensemble. Because keyboards function as the principal controllers for much of the current software, as well as the locus of pedagogy in the Western concert tradition, composers are necessarily using keyboards (as well as an array of other gestural controllers, such as ribbon controllers and joysticks) to recreate the "natural" phrasing and limitations of any given instrument. Here we see generic conventions and performance practices strongly determining how new instrument technologies are put to use, even when there is no necessary material correlation between the performer's body, the instrument's construction, and the resultant sound.

product of each instrument’s unique assemblage of components—is the source of their charm. In the hands of another generation of musicians, these “amplified ancients” are now in the service of new modes of expression that, it must be said, were not so apparent the last time these “old” instruments were “new.”

Every musical genre is circumscribed by norms dictating what kinds of technology and what uses of technology may be employed in its production. Throughout this chapter I have attempted to remain relatively genre agnostic in order to analyze a diverse array of new instruments as possible interpretations of pre-existing instrument technologies, as well as solutions to the problems these older instruments posed for contemporary musicians. Nonetheless, questions about the legitimacy and authenticity of techniques and technologies have been raised throughout by critics, and a history of popular music technologies in the 1960s should account for the congruencies and conflicts that emerge between the theory and practice of genre. In the following chapter, I focus specifically on rock, a genre with huge popular and commercial appeal, and which exerted a great force on the instrument industry as it swelled in the middle of the decade and onward. My principal contention will be that the technological gap separating what was possible in the recording studio from what was possible on stage during the mid-to-late 1960s played a powerful role in both shaping the aesthetics of rock and setting the research and development priorities of instrument designers. As I’ve shown in this chapter, an instrument like an electric harpsichord or electric sitar could be used to bridge this gap between recording and live performance. But, given the harsh critiques of influential rock writers like Richard Goldstein, would such a move be appropriate given the conceits of the genre? Thus, I situate the various controversies emerging around new, electrical instrument technologies against an overview of rock’s claims to seriousness and the basic premise that rock is invested in

unmediated expressions of “truth,” which are ultimately corroborated or undermined by the processes through which musical works are produced.

Chapter 3 | (Dis)honest Music: Authorship and authenticity between stage and studio

"We went to the brink of disaster with psychedelic music, then beyond what can only be described as 'un-understandable music.' There was no excuse for it. The challenge was to see how far out they [The Beatles] could go, and in the process they lost a lot of people. The Beatles started the swing back, and now we're moving into the country music cycle and a rebirth of honest rock 'n' roll."[1]

— Dick Clark, 1969

It is a common narrative trope that the "psychedelic" sixties ended on December 6, 1969 with the Rolling Stones' infamous concert held at the Altamont Speedway in northern California.[2] But while the Free Concert—what John Burks of *Rolling Stone* once termed "rock and roll's all-time worst day"—powerfully articulates the turn of the decade as a sharp dividing line between two starkly different cultures, it obscures the gradual shifts in popular culture, especially musical style, that were taking place as soon as 1967's Summer of Love had turned to fall.[3]

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[1] Mike Gershman, "The Blues, Once Black, Now a Shade Whiter," *Los Angeles Times*, January 19, 1969, Q1.
[2] Rob Chapman, for example, in his 2015 study of psychedelic music and culture, writes "Ultimately, Altamont was the end of psychedelic theatre, the defining moment when the legacy of the *City Scale* Happening, Anna Halprin's joyous and liberating physical meditations, the Mime Troupe's mimicry and the playful antics of the Acid Tests came to grief in a blood-flecked cinder pit at a demolition-derby site." Rob Chapman, *Psychedelia and Other Colours* (London: Faber & Faber, 2015), 252.
[3] John Burks, "In the Aftermath of Altamont," *Rolling Stone*, February 7, 1970, accessed January 27, 2017, http://www.rollingstone.com/music/news/in-the-aftermath-of-altamont-19700207.

Immediately following the heyday of psychedelia, many of pop and rock's biggest stars executed a stylistic about-face. Eschewing the perceived complexities of psychedelic rock, these musicians looked back in time and away from the turned-on urban centers of San Francisco and London to the "unspoiled" sounds associated with Nashville. This shift away from the timbral and gestural palette of psychedelia was tied to changing conceptions of the function of popular music and the social role it was meant to play. As Ellen Willis wrote for *The New Yorker* in 1969, "Behind the fascination with Nashville is the need to preserve music as a diversion—a respite from high art and political headaches."[4] One of the earliest releases in this manner was Bob Dylan's *John Wesley Harding*, released in December of 1967. This album, as well as 1969's *Nashville Skyline*, constituted a marked shift away from the brash electrical instrumentation and oblique poetry of his own *Highway 61 Revisited* (1965) and *Blonde on Blonde* (1966). Furthermore, they signaled an even greater shift away from the studio manipulations characteristic of psychedelia, a style that had risen to prominence while he was absent from the public sphere following his June 1966 motorcycle accident. Like his earlier work, Dylan's late-sixties albums exerted influence on the field of popular music as a whole. Willis herself judged Dylan's new work as "some timely propaganda for simplicity," a remedy for the abstruse lyrical conceits of psychedelia.[5] In this vein, too, were 1968 releases by The Byrds (*Sweetheart of the Rodeo*), progenitors of the early psychedelic hit "Eight Miles High" (1966); The Band (*Music From Big Pink*)*;* and the Beatles themselves. Indeed, Dick Clark's scathing condemnation of psychedelic music quoted above was published on the heels of November 1968's *The Beatles*.[6] For many critics these albums cumulatively signaled a movement away from the perceived

[4] Ellen Willis, "Roots," *The New Yorker*, February 22, 1969, 116.
[5] Ellen Willis, "Records: Rock, Etc.", *The New Yorker*, July 6, 1968, 56-57.
[6] Although rather eclectic stylistically, *The Beatles*' austere white cover powerfully signified the group's movement away from the psychedelic visual tropes employed on *Rubber Soul*, *Revolver*, and *Sgt. Pepper*.

excesses of psychedelic music toward the "purity" of rock's origins: the "honest" rock 'n' roll of the 1950s.[7]

But what were these musicians "returning" from? What aspects of their previous musical style did critics like Clark find dishonest? In a January 1969 *Vogue* article celebrating a new generation of singer-songwriters including Tim Buckley, Richie Havens, Joni Mitchell, and Arlo Guthrie, critic Mike Jahn provides some clues:

> When the first wave of San Francisco musicians took the progressive pop fire created by the Beatles and Americanized it, they opened the door to a flood of electronic gimmicks, squeezed harmonies, and pinched imaginations.… Where electronic devices were once used to enhance, they became a *cause célèbre* of their own.… Now the dominant trend is to the real, the believable. Music that is music and not a collection of noises."[8]

The crux of Jahn's analysis is the belief that recordings of popular music are meant to represent something "real" and "believable."[9] But, just as importantly, Jahn's criticism places the sonic vocabulary—and the novel, electronic means by which it was expressed—front and center in his

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[7] Toward the end of the decade, the British periodical *Beat Instrumental* began running a series of nostalgic articles looking back at the artists of the 1950s and theorizing their influence on the rock music of the present. Of especial significance was a regular feature, launched in 1970, entitled "Rock & Roll Giants," which featured profiles of Elvis Presley, Little Richard, Eddie Cochran, Gene Vincent, Fats Domino, Bill Haley, and Jerry Lee Lewis. See, also, "1957: The Year of Rock," *Beat Instrumental* 51, July 1967, 39.

[8] Mike Jahn, "Where Pop Music Is Now," *Vogue*, January 1, 1969, 130, 131, 178.

[9] Scholars such as Theodore Gracyk have critiqued this idea of naturalism in recording, arguing that the feeling that this is "really happening" is often elaborately constructed. See, for example, Gracyk's discussion of the Sex Pistols' work with engineer Chris Thomas in Theodore Gracyk, *Rhythm and Noise: An Aesthetics of Rock* (Durham and London: Duke University Press, 1996), 41-42. Such readings have been crucially supported by musical paratexts. Rob Chapman, for example, has critiqued the faux-naturalism of the "down-home" look adopted at the close of the decade by artists like the Grateful Dead, the Byrds, and the Band, the latter of whose publicity photos articulate them as "backwoodsmen, high-plains drifters, prairie prowlers, bar-room brawlers." As Chapman writes, the choice between the trappings of psychedelia and purportedly "honest" rock music was merely "forsaking one mythology for another: acid for Americana." Chapman, *Psychedelia and Other Colours*, 170.

condemnation of psychedelia's dishonesty.[10] Indeed, the deep connection between psychedelic rock's lyrical tropes, affective states, and electrical instrument technologies has been explored by many writers on the topic. In her analysis of Jimi Hendrix's "Love or Confusion," for example, Sheila Whiteley posits a homologous relationship between the psychedelic experience—which she regards as disorienting and unpredictable—and the sounds heard: "The endless feedback and distortion move the listener into an equivalent state of incoherence, the montage of sound effects, reverb, echo, tremolo and fuzz, resonating with the vocal message 'pounding, pounding, going 'round and 'round and 'round and 'round'."[11] Critic Jim DeRogatis likewise posits the centrality of electrical technologies in the sound-world of this style: "Because of its emphasis on sounds that fire the imagination, psychedelic rock has often been the first genre to embrace technological advances in music making."[12] Anne Johnson and Mike Stax, in their history of the relationship between the subgenres of psychedelic and garage rock, are perhaps the most explicit on this point: "The psychedelic sound *was a product of the technology of the time* and the customs and practices of bands taking up the topic. Garage bands contributed a particular grammar or set of signifiers to psychedelic culture that would shape the direction of psychedelic music [emphasis added]."[13]

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[10] It is important to note, too, that the electronic-ness of the sound technologies employed was of chief interest to commentators on the phenomenon of psychedelic rock. *Billboard*, for example, defined psychedelic rock as: "Music that blends poetic lyricism with electronic amplification." "Coast Confab: Psychedelic Rock Music Market Is Mushrooming," *Billboard*, April 8, 1967, 12. *Variety*, similarly, described these musicians as "electronic communicators." "New Breed of Psychedelic Rock Iconoclasts Eager to light Up Future," *Variety*, August 9, 1967, 49.

[11] Sheila Whiteley, *The Space Between the Notes: Rock and the Counterculture* (London; New York: Routledge, 1992), 22.

[12] Jim DeRogatis, *Turn on Your Mind: Four Decades of Great Psychedelic Rock* (Milwaukee, WI: Hal Leonard, 2003), 14.

[13] Anne Johnson and Mike Stax, "From Psychotic to Psychedelic: The Garage Contribution to Psychedelia," *Popular Music and Society* 29/4 (2006): 423.

One of the guiding questions in this chapter, then, is the following: under what circumstances did the electrical technologies employed in psychedelic rock become coded as dishonest in the discourses circulated by rock musicians, fans, and critics? As a preliminary step toward broaching this, we might first ask: what does it mean for a piece of music to be honest? Honesty is an unwaveringly positive term and, in relation to music, might take on several meanings. On the one hand, it pertains to truthfulness and to an absence of deceit. Relatedly, there is a fundamentally ethical dimension to honesty: honest behavior is moral and virtuous. There is also the connotation that an "honest" wage or an "honest" living is that which is earned fairly, accrued principally through the travails of hard work. Finally, there is an aspect of simplicity. Something honest can be unpretentious, devoid of complexity. All of these values find expression in critical discourse around rock music during the transitional period 1967-68, as the principal source of rock's mainstream accreditation shifted from bastions of high culture to an emergent body of rock critics proper. This new cadre comprised both newly founded rock-focused periodicals (*Rolling Stone*, *Crawdaddy!*) and columns in established middlebrow publications (Robert Christgau in *Esquire*, Willis in *The New Yorker*, Richard Goldstein in *The Village Voice*, and so on). As high-culture pundits like Ned Rorem and Leonard Bernstein began to approbate rock music for its perceived amenability to the evaluative precepts of their own fields, rock critics worked to articulate an aesthetic for this music independent of those employed in the discourse surrounding classical music and jazz.

I also want to suggest that an interrogation of the mechanisms by which a genre of music, a type of technology, as well as a delimited set of techniques can come to be read as expressing (dis)honesty must also take consideration of the entity to which such enunciations are attributed, whether real or imagined. What is at stake here is the "authenticity" of music and of the people

who realize it, and scholars proceeding from a variety of disciplinary backgrounds have been deeply concerned with elucidating how this concept functions in many different genres. Authenticity has been an especially important (if also vexing) concept within the study of rock, and I begin this chapter with a review of important literature on the topic, focusing principally on the importance that rock culture places on the identity of an author as well as the processes by which they produce their work. I suggest that rock culture's desire to hear this music as emanating from a single author (whether an individual or a bounded collective, such as a performing group) is always problematized by the fundamentally collaborative nature of making records and producing concerts, where simple dichotomies between "technical" labor and "musical" expression ultimately prove misleading.

How, then, do rock artists navigate this contradiction? In the second half of the chapter I use three case studies to demonstrate a range of strategies employed by rock musicians in order to authenticate their status as the authors of their recorded work in live performance. In the first, I show how the gap between stage and studio technology led some artists to forsake the sonic affordances of the studio in favor of producing recordings that could be reproduced on stage and thus demanded to be heard as a real, live event. This "quasi-realist" recording aesthetic was most vociferously championed by Vanilla Fudge, who positioned studio technologies as a crutch for poor musicianship. I then turn to the work of Jimi Hendrix, who also espoused a desire to reproduce his songs live as they were heard on record. While his ability to do this was largely facilitated by his unique mastery of the electric guitar, Hendrix also collaborated closely with the engineers Roger Mayer and Eddie Kramer. I suggest that their contributions played an important, if poorly understood, role in helping Hendrix to realize his goal, and an examination of their working methods affords an opportunity to consider which kinds of actions are considered

authorial within rock culture. My final case study considers the importance of gestural mapping for helping audiences to understand where, and from whom, a sound originates. New electrical technologies both allowed musicians to incorporate new sounds into their live performances and simultaneously challenged our understanding of the causal relationship between their actions and the resultant sounds. Similarly, these instruments can also force us to question whether a human or a machine is most responsible for what we hear, casting one of rock's principal criteria for asserting authenticity into doubt. I use the fuzz pedal and the synthesizer as my central examples here, and show how musicians, fans, and critics were conflicted about the merits of these devices. Their debates highlight questions about the ontology of music, especially with regard to the potential primacy of timbre over pitch and rhythm in some genres of music, as well as the importance of developing strategies to communicate technical mastery with new technologies in genres like rock, which place a high premium on demonstrations of virtuosity.

Taken together, these three case studies highlight the importance not only of using new technologies, but of actively managing knowledge about new technologies, in order to align works with the professional and aesthetic concerns governing practice in different musical genres. Given rock culture's longstanding concern with ideas about "authenticity" and "truth" in music, I use these examples to show how technology is effectively agnostic to such matters. Rather, (dis)honesty is produced discursively. I conclude the chapter by reconsidering the question of authorship in rock, and suggest that we need to consider its dual nature as an essential element in the reception of rock works (authorship as a "status") as well as an explanatory mechanism to describe the genesis of such a work (authorship as a "fact").

3.1: Rock Authenticity

Before proceeding to the case studies, it will be useful to spend some time unpacking how authenticity has come to function within rock culture, as well as its origins in the mass culture critiques of the early twentieth century. This background will help to contextualize the discursive challenges that rock authenticity might pose to musicians working collaboratively and with certain kinds of technology. Firstly, "authenticity" is a major structuring concept in rock's evaluative framework, where it functions as an umbrella term encapsulating a variety of claims toward rock's seriousness relative to other forms of popular music. Crucially, authenticity adds an ethical dimension to questions of aesthetics which, in the case of rock music, is most strongly predicated upon a rejection of commercialism.[14] Indeed, in their study of rock criticism, Ulf Lindberg and his co-authors offer a useful formulation positing commercialism as an "other" against which rock can define itself.[15] This gesture furnishes rock with its fundamental paradox: it is, in the words of Keir Keightley, a "massively popular anti-mass music."[16] As scholars such as Keightley, David Brackett, and Bernard Gendron have written, it was by and large the urban folk revival of the late 1950s and early 1960s that furnished rock with this component of its ideological framework.[17] Drawing on Pierre Bourdieu's theories of symbolic and economic capital, Keightley and Brackett argue that "serious" folk artists were disinterested in commercial success, or at least presented themselves as such. On the contrary, success was predicated upon

[14] While this is a distinctive feature of rock ideology, Keightley has argued that a rejection of commercialism within the field of popular music already occurred during the big band and swing era of the 1930s. See Keir Keightley, "Reconsidering Rock," in *The Cambridge Companion to Pop and Rock*, ed. Simon Frith, Will Straw, and John Street (New York: Cambridge University Press, 2001), 111.
[15] Ulf Lindberg et al, *Rock Criticism from the Beginning* (New York: Peter Lang, 2005), 45.
[16] Keightley, "Reconsidering Rock," 125.
[17] For more on the influence of folk and folk-rock on furnishing rock with these aspects of its ideology, see David Brackett, "Rock," in *The Continuum Encyclopedia of Popular Music of the World*, vol. 10, ed. John Shepherd (forthcoming), especially 17-27; Keightley, "Reconsidering Rock," especially 120-22; Bernard Gendron, *Between Montmartre and the Mudd Club: Popular Music and the Avant-Garde* (Chicago; London: Chicago University Press, 2002), especially 180-83.

recognition by peers and cultural gatekeepers.[18] But, rather than use the anti-commerce polemic of the folk revival to separate rock music from the mainstream, rock's pundits used it to effectively, in Keightley's phrasing, "cleave" the mainstream in two: into "pop" (the trite) and "rock" (the serious).[19] Indeed, because rock—unlike other elite cultural forms, such as classical music and jazz—emerged *within* the larger field of popular music, judgments concerning taste and distinction function to internally differentiate and stratify popular works and performers according to their perceived value, rather than to distinguish outright between so-called "high" and "low" culture. As Lawrence Grossberg writes, it is through this bipartite division between rock and "mere" entertainment that rock becomes invested with an "excess"; whatever the heterogeneity of its sounds and styles, "what defines rock's difference—what made it an acceptable, even an important investment—is simply the fact that it matters."[20] Authenticity, however mutable, is the sign of this mattering.

Because much of the social context for rock's emergence was bound up with debates about mass culture, the urban folk revival provided access to positive values believed to have been displaced by processes of urbanization and industrialization. Mass culture, in its modern formulation, is characterized by its usage of techniques of industrial mass production—epitomized by the distribution of labor and specialization typical of the assembly line—and is aligned with the emergence of technologies like radio, cinema, and the popular press, which enable single entities to diffuse content broadly to a wide audience. Correspondingly, the ensuing centralization of culture production has been connected to fears of commercialization and

[18] Pierre Bourdieu, *The Field of Cultural Production* (New York: Columbia University Press, 1993). See also Brackett, "Rock," 17-18.
[19] Keightley, "Reconsidering Rock," 127.
[20] Lawrence Grossberg, "The media economy of rock culture: cinema, postmodernity and authenticity," in *Sound and Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin and Lawrence Grossberg (London: Routledge: 1993), 172.

political propagandizing, especially in the hands of fascist governments. As Dominic Strinati notes in his survey of theories of popular culture, the commercial imperative of mass culture precludes opportunities for cultural forms that are incapable of generating profit, principally what he refers to as "art" and "folk" culture.[21] These forms were venerated by cultural theorists in their critiques of mass culture throughout the first half of the twentieth century (perhaps most notably by Theodor Adorno and the other members of the Frankfurt School) and continued to be mobilized by post-war critics such as Dwight MacDonald. Indeed, such criticisms of mass culture as a dehumanizing agent continued to find expression up until the eve of rock's emergence, as in the "bottomless chasm of vacuity" observed by critic Paul Johnson in a new breed of TV program inaugurated by the likes of the Jimmy Saville-hosted *Top of the Pops*, which prominently featured shots of "young girls, hardly any more than 16, dressed as adults and already lined up as fodder for exploitation."[22]

Johnson's critique was penned during Beatlemania, a period when sociologists, psychologists, and other intellectuals were feverishly debating the negative effects of mass culture, especially the Beatles' early music (prior to the period that Gendron has described as rock's "cultural accreditation").[23] Pieces like David Dempsey's "Why the Girls Scream, Weep, Flip," written for the *New York Times*, are typical in their fusion of Frankfurt School-style inquiries concerning the power of mass culture to enforce conformity with a paranoid reading of the racial connotations of "the beat."[24] The fear was that mass culture could fully strip people of their individuality, already alienated, as they were thought to be, in their atomized urban existence, lacking an unassailable moral grounding wrought by their belonging to a traditional

[21] Dominic Strinati, *An Introduction to Theories of Popular Culture* (London; New York: Routledge, 1995), 10.
[22] Paul Johnson, "The Menace of Beatlism," *New Statesman*, February 28, 1964, 327.
[23] See chapters eight and nine in Gendron, *Between Montmartre and the Mudd Clubb*.
[24] David Dempsey, "Why the Girls Scream, Weep, Flip," *The New York Times*, February 23, 1964, SM15.

religious and/or regional community. Through the influence of the folk revival (especially through the figure of Bob Dylan) and, to a lesser extent, the British blues revival, the principal preoccupations exhibited by critiques of mass society (conformity, alienation, community, materialism, preserving the integrity of art against commerce, and so on) found augmentation in rock.

Although critics like Johnson and Dempsey were concerned with the effects of mass culture on youth, one of the critical movements made by rock culture was to subsume the music of "teenagers" (e.g. rock 'n' roll) within that of the broader "youth" category, which included the serious music of college-aged listeners (e.g. folk). On the one hand, this allowed certain genres of popular music—especially those demonstrating "thoughtful" lyrics, such as Bob Dylan and the Beatles as of *Rubber Soul* (1965)—to assume an unprecedented level of symbolic capital and, thus, remove the impetus to mature out of listening to it as one reached adulthood. Furthermore, as the adult world and its institutions became increasingly viewed with skepticism predicated upon mounting civil unrest, war, and corruption, the culture of the "youth" became something desirable for those who found themselves beyond the assumed boundaries of cultural age-grading. Indeed, as Thomas Frank writes in his history of hip consumerism, *The Conquest of Cool*, in the mid-1960s youth became a "consuming position to which all could aspire"; if one was not "young" then they could nonetheless at least try to be "youthful" by purchasing products that would reinforce such an identity and make it legible to oneself and others.[25]

If the fundamental context of rock is mass culture, and if its raison d'être is to critique this context, then its principal discursive foes are the effects of mass culture: alienation, conformity,

[25] Thomas Frank, *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism* (Chicago; London: The University of Chicago Press, 1997), 25.

materialism, and so on. As Keightley writes, the principal means for doing this was to assert and to advocate for a kind of "distinctive individualism" wherein positive traits ("serious," "oppositional," "truthful," "anti-mass") are to be located in rock while negative traits ("trivial," "complicit," "fraudulent," "mass") are located in pop. In order to make these value judgements, rock musicians, critics, and fans advanced a series of arguments holding that the conditions of popular music's production and consumption carry social implications beyond their immediate capacity to instill pleasure, a situation of which the pop milieu is understood to be completely oblivious (or at least complacent). But while both production and consumption are salient issues for rock culture, its evaluate frameworks tend to focus principally on how music is made rather than consumed. Indeed, because of its fundamental contradiction as a "massively popular anti-mass music," too much attention paid to rock's practices of consumption might weaken the premises through which it advances its claims to seriousness. Keightley describes this as an act of misdirection: "Mass commodity *consumption* no longer seems incompatible with rock because rock's critique of the alienation and complicity implicit in that consumption is reworked as a critique of the means of musical *production*."[26]

In the pages that follow I examine two aspects of musical production that bear seriously upon the evaluation of rock works (whether sound recordings or live performances): who is responsible for creating the work, as well as the means by which they went about making it. Rock culture idealizes a performer-as-*auteur* model of composition and communication, wherein personal acts of expression are transmitted directly from artist to audience without distortion or loss wrought by a variety of agents and actions broadly encapsulated by the term "mediation." But rock works are complex productions that depend upon many different kinds of skills—and

[26] Keightley, "Reconsidering Rock," 129.

therefore many different individuals—for their realization. Given this paradoxical situation, how do certain rock performers come to accrue legitimation based on their "authenticity," and—to return to where we began in this chapter—what role does technology play in such evaluations? I begin by examining the shifting cultural capital of rock performers, especially with regard to their then-newfound status as "artists" rather than "entertainers." Following this, I survey some of the myriad ways in which different uses of technology can both enable and inhibit the communication of authenticity and interrogate the contingencies that structure such evaluations. I then place the rock culture of the late 1960s within a broader framework for thinking about collaborative authorship and, in the second half of the chapter, suggest some alternative strategies for thinking about how notions of authorship and technology interact in the reception of musical works. As we will see, musicians, fans, and critics are deeply sensitive to the ways in which technologies might mediate expressive acts; a reception-based study can do much to reveal the imprint of both technology and attitudes *about* technology on cultural products.

3.1.1: Who Makes Music Matters

"If you want to come up with a singular, most important trend in this new music, I think it has to be something like: it is original, composed by the people who perform it, created by them—even if they have to fight the record companies to do it."[27]

— Frank Zappa, 1968

[27] J. Marks, *Rock and Other Four Letter Words: Music of the Electric Generation* (New York: Bantam Books, 1968), no page numbers.

One of the most significant developments over the course of the 1960s with regard to rock is the expansion of the auteur-status of its stars. This trend had already been inaugurated by some of the most successful artists of the 1950s; many of the principal stars of the first wave of rock 'n' roll, such as Buddy Holly and Chuck Berry, had made inroads in dismantling the distribution of musical labor associated with pre-rock-'n'-roll pop by performing songs of their own composition. Nonetheless, these performers were still by and large regarded (and regarded themselves) as entertainers. By contrast, rock musicians of the 1960s benefitted from a precipitous rise in the symbolic capital accorded to their work during the years 1964-67.[28] Indeed, by the mid-1960s many popular musicians began to be regarded as serious artists and, accordingly, to receive the same level of prestige enjoyed by other members of that strata.[29]

This distinction between artist and entertainer elucidates an important difference between the values ascribed to popular musicians on account of their understood motivation. While the entertainer is oriented outward toward their audience and its desires, the artist is oriented inward toward their own experience and needs. The ultimate wellspring of worthy art in 1960s rock

[28] See chapter eight in Gendron, *Between Montmartre and the Mudd Club*.

[29] One of the most striking shifts with regard to the self-perception of popular musicians as artists in the 1960s can be observed in the extra-musical endeavors in which they engaged. The Beatles, as always, are exemplary in this regard. While the publication of John Lennon's 1964 poetry collection, *In His Own Write*, was of little importance relative to the group's other achievements of that year, it has been highlighted by Gendron as an important step toward establishing a layer within the Beatles' aesthetic project targeted toward adults. See Gendron, *Between Montmartre and the Mudd Club*, 168. That same year the group would make their debut film appearance in Richard Lester's "arty" *A Hard Day's Night*, continuing a practice—though wildly different in tone and reception—that had already been well trodden by the rock 'n' rollers of the 1950s, especially Elvis Presley. Andrew Sarris' review of *A Hard Day's Night* for the *Village Voice* is an important step in this shift in their reception. See Andrew Sarris, "Bravo Beatles!", in *The Pop Rock and Soul Reader*, ed. David Brackett, third edition, 205-207 (New York; Oxford: Oxford University Press, 2014). But, while popular musicians had long been both the stars and the subjects of films, it was the Beatles again—though, tacitly, Paul McCartney—who would expand upon this by becoming filmic authors through the receipt of their first directorial credit for 1967's *Magical Mystery Tour*. Although the medium of film was crucial for the dissemination of rock culture throughout the 1960s—especially D.A. Pennebaker's films *Don't Look Back* (1967) and *Monterrey Pop* (1968), as well as Michael Wadleigh's *Woodstock* (1970)—it was unusual for musicians to assume a directorial role. *Magical Mystery Tour* was widely regarded as a flop, principally by virtue of its perceived self-indulgence and obscurity. Even so, some of the more generous critics recognized the film as an attempt by the Beatles to develop as artists—to "further themselves," in the words of *Melody Maker*'s Alan Walsh—an indulgence that was permissible so long as they could self-fund the project. Alan Walsh, "…or were the TV critics right?", *Melody Maker*, January 6, 1968, 5.

culture, then, was the personal drive of autonomous agents, unaffected by external demands such as commerce and even intelligibility.[30] This highly individualistic conception of the artist is a central feature of the ideology and aesthetics of Romanticism. Simon Frith and Howard Horne have argued for the special role played by the UK's art colleges in cultivating this Romantic conception of the artist and, furthermore, in educating many of the individuals that would eventually make their careers in rock: "rock, then, unlike pop, was to be serious, progressive, truthful, and individual, a cluster of terms whose significance lay in the Romantic self-image of the 1960s art student."[31] This is the same constellation of values that finds expression in Frank Zappa's epigraph quoted above. Indeed, Keightley highlights an important etymological connection between "authenticity" and "author," which draws the two concepts together around an axis of selfhood:

> Rock culture's embracing of performers who author their own songs is one key instance of this concern with mediation. Like "authenticity," the word "author" is etymologically related to the "self." If the rock musician's "self" is not involved in originating the text she or he performs, rock believes that self is more likely to be corrupted or alienated.[32]

[30] Brackett highlights the Jefferson Airplane's 1967 release, *Bathing at Baxter's*, as an example of popular musicians pursuing their "artistic vision" in spite of commercialism. See Brackett, "Rock," 44-46. The unprecedented retirement from live performance of major stars like the Beatles and Bob Dylan can also be read as a response to this newfound gap between the expectations of popular music performers and those of their audience, who would not allow them to develop in this capacity. See David Pattie, *Rock Music in Performance* (Houndmills, Basingstoke; New York: Palgrave Macmillan, 2007), 63.
[31] Simon Frith and Howard Horne, *Art into Pop* (London; New York: Methuen, 1987), 90.
[32] Keightley, "Reconsidering Rock," 134.

While postulating a coherent, communicable "self" is problematic, it remains a powerful discursive maneuver.[33] The ideal rock author is not merely the recipient of the rights that come with ownership of a piece of intellectual property (i.e. author's rights) but, rather, the key to interpreting a work, to unlocking its meaning. While artist, author, and authenticity are all independent concepts, they are drawn together in the discourses circulating around rock culture in the second half of the 1960s. "Good" rock performers are those who are authentic, a value judgment ascribed to those who are the authors of musical texts that (purport to) express their autonomy, their selfhood, their distinctive individuality: the very values that mark their opposition to mass culture.

This recognition of popular musicians as artists instead of "mere" entertainers was supported by a variety of new publications, as well as discursive shifts in the rock journalism published in pre-existing periodicals. Crucially, if rock musicians were to be recognized as proper artists, rock critics would need to shift from the sociological discourse that dominated the first half of the decade—exemplified by the writing of authors like Johnson and Dempsey touched upon in the previous section—toward something that would embrace and elucidate rock as a craft. Of especial import was a newfound focus on the technical proficiency of popular musicians, which, in the "hippie aesthetic" outlined by John Covach and Andrew Flory in their rock history textbook, *What's That Sound?*, became understood as "indicators of musical

[33] This topic has been broached by Jolanta Pekacz in an article in which she critiques many of the traditional assumptions of, and narrative devices employed in, biographies of composers. With regard to what she perceives as a false projection of a unified subject, she writes, "Critics argue that the coherence of life presented in a biography is illusory, created by papering over the cracks, concealing the unknown, making causal connections that stem from the mind of the biographer rather than from that of the subject. Not only do lives not have the neat trajectory that the biographer typically aspires to achieve, but personalities and 'selves' often are fragmented and shifting rather than unitary and coherent, defying any biographical aspiration to identify the 'real' person." See Jolanta T. Pekacz, "Memory, History and Meaning: Musical Biography and its Discontents," *Journal of Musicological Research* 23 (2004): 45.

importance."[34] This gradual shift in critical orientation prompted the British music weeklies, especially *Melody Maker*, to devote greater attention to issues of musical skill and provided an impetus for other writers to launch several new, rock-focused publications, such as *Crawdaddy!* and *Rolling Stone*, which played an important role in theorizing this aesthetic.

Perhaps even more significant was the emergence of a new category of magazine altogether: one that focused explicitly on issues of craft in popular music and was marketed toward practicing musicians and serious fans. Such publications touched upon a variety of issues, including equipment, musical fundamentals, songwriting, and so on. The first significant publication of this kind was *Beat Monthly*, a British publication launched in 1963 just after the onset of the British Invasion, which was later rechristened as *Beat Instrumental* (*BI*).[35] Its difference from other varieties of music publication was frequently staked out by *BI*'s editorial staff, as evinced by the preamble to their 1967 best-of poll:

> It's poll time again. Please remember that this is NOT just the normal type of popularity poll. We always ask you to decide which are the best artists in England, taking into account musical ability, artistry and personality—not just chart success.[36]

While "personality" was a mainstay of the "pop mags," the directive to take account of "musical ability" and "artistry" made *BI* rather unique for the period. Indeed, it advanced a major claim about who could be admitted into the serious discursive space constructed by the

[34] John Covach and Andrew Flory, *What's That Sound?: An Introduction to Rock and Its History*, third edition (New York; London: W. W. Norton and Company, 2012), 302.
[35] Despite being based in the UK, *Beat Instrumental* was circulated worldwide. Letters reprinted in the magazine often came from other continents, including Africa and North America.
[36] "Editorial," *Beat Instrumental* 56, December 1967, 4.

magazine. *BI*'s readership regularly praised it for this difference. Reader J. Howe of Southend-on-Sea, for example, deemed *BI* "the only magazine for musicians and music fans—written by music lovers and not chart lovers."[37] This sentiment was often expressed in letters that were reprinted in *BI*, where readers divulged their favorite types of articles, such as Newcastle's D. Trustlove, who enjoyed "the Tutor, and Bass Guitar type of features best, but also those about record production, etc."[38] These kinds of features gave *BI* a distinct cachet relative to the other publications of the time, a difference that was especially lauded by international readers such as Jimmy Gawley of San Francisco who, after picking up a copy of *BI* on a trip to London, lamented "there is no magazine in the U.S.A. which is not printed with the screaming, fan-club type 14-year-old girl in mind."[39] The critical framework pioneered by *BI* would later be taken up by a host of other magazines concerned with the intricacies of rock pedagogy, especially those organized around a single, specific type of musical instrument. Indeed, *Guitar Player*, the first of this type, was launched in San Jose in 1967.[40] Such periodicals, then, manifest a dispersed sonic culture engaged with rock as a technology-driven practice.

3.1.2: How Music is Made Matters

In the preceding section, we established the ideal rock musician as the artist-author, an individual—or group that collectively assumes the status of a distinct, singular entity—whose craft is principally self-expressive and valorized according to the precepts of Romanticism. Once the integrity of this originary presence has been authenticated, rock culture preoccupies itself

[37] "Letters," *Beat Instrumental* 87, July 1970, 53.
[38] "Your Letters," *Beat Instrumental* 60, April 1968, 45.
[39] "Your Letters," *Beat Instrumental* 51, July 1967, 37.
[40] *Guitar Player* was predated by another specialist magazine focused on fretted instruments: *Fretts*. Although *Guitar Player* eventually supplanted *Fretts*, the latter was largely disinterested in developments in rock music during the middle of the decade, and occupied a generally dismissive stance with regard to the electric guitar.

with mediation: that is, anything which threatens to distort that act of self-expression as it travels from sender to receiver. These might include choices pertaining to content, especially if they are made by an agent external to the artist-author entity (who are the songwriters? Who chooses which songs make it onto the recording?); marketing and distribution (is it released on an independent label? On a major?); aesthetics (is the content original?); motivation (is the recording understood to be made for commercial purposes? For art's sake?); and so on. Beyond this, the tools and techniques employed in the production of popular music are especially rich sites to situate an analysis of the reception of musical works. Indeed, as the passages quoted at the beginning of this chapter make abundantly clear, rock audiences are deeply concerned with not only *who* is responsible for a work but *how* they made it, and what they made it with.

The relationship between electrical technologies and rock's discourses of authenticity is paradoxical. In his "Art versus technology: the strange case of popular music," Simon Frith presents several case studies wherein different electrical technologies (the microphone, the electric guitar, and a drum machine) represent a threat to "authenticity or the truth of music" in which they are being employed: "the implication," then, "is that technology is somehow false or falsifying."[41] Frith's examples demonstrate that in any musical culture (including rock) where there is an elision of aesthetic and ethical concerns there will also be rules delimiting the "right" and "wrong" ways to make this music, especially with regard to the use of technology. The problem with technology as a category of objects and practices, however, is its extreme contextual mutability. As Paul Théberge points out in his "'Plugged in': technology and popular music," processes of naturalization obscure the technological nature of many devices and

[41] Simon Frith, "Art versus technology: the strange case of popular music," *Media, Culture, and Society* 8 (1986): 265.

techniques that are fundamental in the production of popular music, such as the microphone, electrical amplification, and the loudspeaker.[42] Put another way, any musical culture's embrace or rejection of technology needs to be squared against present norms of practice and generic expectations, which are themselves historically contingent. Despite the longevity of "technology" as a categorical constant in popular music discourses, its contents have continued to shift over time. This has been especially true of sound recording technologies. While the mass production of sound recordings might be argued to have diminished the "aura" of musical performance, this change has simultaneously rendered accessible specific details of performance and affect that escape notational practice. Indeed, as Frith notes, however much rock culture's concept of authenticity might reject technology writ large, technology has made this concept possible in the first place.[43]

Naturalization, then, can lead to certain technologies becoming accepted while others remain markers of fakery. Such processes of technological development, genre formation, and naturalization can be difficult to trace being, as they are, haphazardly intertwined, both independent and interdependent. But as patterns of technological use stabilize in specific generic contexts, technology can come to function as a marker of a kind of tradition. That is, by appealing to the past, those in the present can make claims about the legitimacy of both a practice and, by correlation, those who uphold it: this is how "we," rather than "they," do it. Already by the late 1960s, rock was assuming the trappings of what Eric Hobsbawm has termed an "invented tradition":

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[42] Paul Théberge, "'Plugged in': technology and popular music," in *The Cambridge Companion to Pop and Rock*, ed. Simon Frith, Will Straw, and John Street, 3-25 (New York: Cambridge University Press, 2001).
[43] Frith, "Art versus technology," 269.

> A set of practices, normally governed by overtly or tacitly accepted rules and of a ritual or symbolic nature, which seek to inculcate certain values and norms of behaviour by repetition, which automatically implies continuity with the past.[44]

In matter of fact, the technologies governing the practices endemic to popular music of the late 1960s were never really up for negotiation. Just as other popular musicians had earlier in the century, rock performers continued to appear on television and radio, sell recordings, and tour, even as the specific nature of these practices adjusted to the fluctuations in rock's cultural status and attendant ideology (e.g. rock performers' embrace of the album rather than the single). But, despite their important differences with regards to affordance, whether a performer employed an acoustic or an electric guitar changed little about *how* that sound was transmitted to their audience. Crucially, it is this absence of practical or technical rationale when choosing an instrument that allows the instrument to assume the symbolic dimension necessary for projecting a sense of tradition. For example, had Bob Dylan's choice to play an electric guitar at the 1965 Newport Folk Festival been borne of a necessity to be heard by his swelling audience, the instrument could not have assumed the ideological weight it now carries. But, rather, Dylan had already been utilizing electrical amplification with an acoustic guitar and harmonica in the years prior, which allowed the electric guitar to function in 1965 as a symbol of his aesthetic shift.

We can see this kind of tradition-inventing rhetoric at work in much of the rock discourse circulating in the formative period 1967-68. Richard Goldstein's *New York Times* review of *Music For Big Pink* is, in many respects, typical. Pleased to find "no dulcimers or synthesizers,"

[44] Eric Hobsbawm, "Introduction: Inventing Traditions," in *The Invention of Tradition*, ed. Eric Hobsbawm and Terence Ranger (Cambridge; New York: Cambridge University Press, 1983), 1.

he articulates a parallel between the Band's "down-home" look and their instrumentation: "just the basic rock combination of organ, drums and guitars, augmented by an occasional piano and a pinch of brass.… The Band tries for less, but accomplishes more. It makes me long to hear real music—just music—again."[45] Goldstein's longing to hear "real music… again" justifies the music of the Band on the grounds that it re-establishes a connection to pre-psychedelic rock (i.e. the rock 'n' roll of the 1950s and the "beat" music of the British Invasion), but this connection is artificial. As Hobsbawm writes, invented traditions are not attempts to transplant the actual circumstances of the past into the present. Rather, "they are responses to novel situations which take the form of reference to old situations."[46] *Music For Big Pink* is valuable not because it faithfully reproduces the music of a bygone era (and in the commercial arena of popular music an era can pass rather quickly) but because it conjures up particular, idealized aspects of the past, poised to remedy the perceived ills of contemporary popular music. Goldstein's rejection of the instrumental indulgences characteristic of psychedelic rock is selective; the ubiquitous presence of Garth Hudson's electric organ and the electronically modulated timbre of Robbie Robertson's guitar on "Tears of Rage," the album's opening track, seems not to have caused him any consternation whatsoever. But, read against rock as a tradition, the Band's decision to "restrict" the instrumentation used on their debut album can be read as an ethical choice, emblematic of how "we"—the constituents of rock culture—do it.

As Steven Feld writes, "authenticity only emerges when it is counter to forces that are trying to screw it up, transform it, dominate it, mess with it."[47] Like authenticity, tradition is a fundamentally conservative force, resisting and attempting to redirect change. Technology—

[45] Richard Goldstein, "'Big Pink' Is Just a Home in Saugerties," *New York Times*, August 4, 1968, D20.
[46] Hobsbawm, "Inventing Traditions," 2.
[47] Steven Feld and Charles Keil, *Music Grooves* (Chicago: Chicago University Press, 1994), 296.

when it is functioning symbolically as a marker of newness, novelty, and change, rather than as a practical or, indeed, a *technical* solution to a problem—has come to play a decisive role in how rock artists are judged by their peers, their critics, and their fans largely because of this disruptive force. The question, then, is the following: which kinds and uses of technology were permissible in this formative period in rock aesthetics? And which threatened to over-mediate an expressive act, rendering it inauthentic? In the following section, I suggest that much of the discourse around this issue has been shaped by a tension between the fundamentally collaborative nature of rock's production methods and its idealization of the auteur-status of its performing artists. Correspondingly, judgments concerning authenticity are often made with reference to what is technologically feasible in a live performance environment, such as the stage, rather than the studio.

3.1.3: Popular Music and Collaborative Authorship

As the preceding makes clear, of dire importance in any evaluation of a rock work in the late 1960s is consideration of who made the music and how they made it. But this poses a problem: the production of rock works—principally recordings but also live performances, which I will discuss later in this section—requires a large set of skills unlikely to be possessed in any significant capacity by a single person and, therefore, not exercise-able according to professional standards. Recording, then, is a fundamentally collaborative process, and the contributions of many individuals might bear some import on the significant aesthetic features of a resultant work. In this section, I consider the following questions: which features of a popular music recording are prioritized at this time? Can the acts that furnish these features be considered

authorial in nature? And, how might the distributed agency typical of collaborative enterprise impact our understanding of how concepts of authenticity function in rock discourse?

Building upon the work of Bernard Gendron, I explained in the previous chapter that an important part of the context for the employment of a variety of unusual instruments on popular recordings in the mid-1960s was the emergence of a novel evaluative discourse focused on sound.[48] In his discussion of rock musicians' attention to the sound of records, their "record consciousness," Theodor Gracyk goes so far as to postulate, specifically with regard to the Rolling Stones' 1964 cover of Buddy Holly's "Not Fade Away," that "a new sound was equivalent to a new song."[49] That is, while both recordings featured a similar harmonic, melodic, and textual structures, the Stones' version could nonetheless be heard as an original in a meaningful way because of its radically different "sound." So, if a rock concept of authenticity assumes that the performer is an auteur, and the authorial essence of a rock recording is its sound, then there is also a tacit assumption underlying this conception of rock authenticity that the musicians themselves are the authors of the sounds they produce. Indeed, Frith and Horne corroborate this expectation when they write, "The star system works by making them publicly responsible for their own sounds; the sales apparatus of the music press, radio and television depends on the star interview, on the myth of individual production."[50]

Given its centrality as both the principal commodity-object and mode of experiencing popular music, the vast majority of scholars addressing postwar popular music acknowledge recording as the principal medium of the field. But, as writers like Albin Zak, Simon Frith, Simon Zagorski-Thomas, Paul Théberge, and others have emphasized, recording is a

[48] See Gendron, *Between Montmartre and the Mudd Club*, 175-80.
[49] Gracyk, *Rhythm and Noise*, 92.
[50] Frith and Horne, *Art into Pop*, 3.

fundamentally collaborative enterprise whose diverse practices challenge longstanding notions of individual genius, despite the star system and the anti-mediation premises of rock culture. Zak, for example, emphasizes recording as an "inclusive process," recognizing that "all involved are contributors to the compositional project in some way, for all have some effect on its outcome." He highlights the possibility for fluidity between designated roles and uses the more general term "recordist" to encapsulate the contributions of songwriters, arrangers, musicians, producers, and engineers.[51] Frith and Zagorski-Thomas, too, problematize any easy distinction between the nature of the contributions made by technical and artistic personnel by focusing on their common object. As they write in the introduction to *The Aesthetics of Record Production,* "in the studio technical decisions are aesthetic, aesthetic decisions are technical, and all such decisions are musical."[52] Correspondingly, the figures of the engineer and the producer have featured prominently in recent studies of popular music, which have sought to elucidate the aesthetic characteristics furnished by what are ostensibly technical decisions.[53]

Beyond such scholarly works, in recent years a cadre of celebrity engineers and producers has benefitted immensely from an increase in the attention paid to their contributions to now-classic recordings—especially from the 1960s and 70s—and the development of audio production tools designed to recreate these "vintage" sounds. Such products might comprise samples, software plugins, and presets designed to recreate specific sounds associated with

[51] Albin Zak, *The Poetics of Rock* (Berkeley; Los Angeles: University of California Press, 2001), xii.
[52] Simon Frith and Simon Zagorski-Thomas, "Introduction," in *The Art of Record Production*, ed. Simon Frith and Simon Zagorski-Thomas (Farnham, Surrey; Burlington, VT: Ashgate, 2012), 3.
[53] In addition to the literature produced by Frith, Zak, and Zagorski-Thomas, Susan Schmidt Horning's writing on recording engineers and their practices has been particularly informative. See, especially, "Engineering the Performance: Recording Engineers, Tacit Knowledge and the Art of Controlling Sound," *Social Studies of Science* 34/5 (December 2004): 703-731; and *Chasing Sound*: *Technology, Culture, and the Art of Studio Recording from Edison to the LP* (Baltimore, MD: Johns Hopkins University Press, 2015). Virgil Moorefield's monograph on the role of the producer presents an interesting account of the changing responsibilities of this individual, though I am not convinced of the utility in applying auteur theory to explain their current status. See Virgil Moorefield, *The Producer as Composer: Shaping the Sounds of Popular Music* (Cambridge, MA: The MIT Press, 2010).

specific individuals. For example, Andy Johns, whose recording credits include significant 1960s acts like the Rolling Stones and Led Zeppelin, has released his own library of drum samples. Although these are not the same sounds heard on the famous records he engineered, their value as a commodity is contingent upon purchasers enjoying the drum sounds on records like *Led Zeppelin IV* (1971), understanding Johns' contribution in determining the drum sounds on those records, and then transferring that association to the sample library. This is particularly important, as such sounds are often essential components of rock compositions. Indeed, bands like Led Zeppelin often wrote new compositions around striking sounds produced in a studio environment. As bassist John Paul Jones has said of 1971's "When the Levee Breaks," the track's unique drum sound "wrote the song.… That whole song just came from the drum sound."[54]

But while sample libraries furnish ready-made sounds, there is also a burgeoning market for digital signal processing (DSP) software that purports to transform diverse source material according to the sensibility of celebrity engineers. Waves, for example, one of the largest companies producing DSP software for both consumer and professional audio markets, has released a "Signature Series" of plugins "precision-crafted to capture the artist's distinct sound and production style." Like the musicians themselves, the engineer here assumes the high-prestige status of an "artist." One such engineer is Eddie Kramer, famous for his work with 1960s acts like Led Zeppelin and Jimi Hendrix. In the product literature on the Eddie Kramer Drum Channel plugin, for example, Kramer writes: "the Drum Channel plugin really captures

[54] John Paul Jones, quoted in Gracyk, *Rhythm and Noise*, 65. Gracyk describes the sound heard on "When the Levee Breaks" as having been produced by situating the drums in a hall by a stairwell then "[placing] two M1160 microphones high *above* the drums rather than record them closely, then [running] it through an echo unit." Curiously, when Gracyk discusses *who* did this work, he refers to "they," implying Led Zeppelin themselves; Andy Johns, who engineered the record, is not mentioned anywhere in his discussion.

the essence of *my* drum sounds [emphasis added].” And each element of the Eddie Kramer Signature Series purports to put “the classic rock sound of the ‘60s and ‘70s… at your fingertips!”, a now-distinct category of sound that Kramer had some role in shaping.[55] Sounds authored by celebrity engineers are also a common feature packaged alongside software plugins that attempt to model the behavior of analog circuitry and transfer it into a digital work environment. A selling point for Waves’ SSL 4000 Collection (a series of channel strips, equalizers, and compressors modeled on those found in Solid State Logic’s 4000-series mixing consoles, which have been highly prized and utilized by engineers since the 1970s) is the inclusion of presets from “Grammy®-winning producers & engineers” like Chris Lord-Alge, Dave Pensado, and Steve Lillywhite.[56]

As this short survey of recent work on the production of popular music recordings demonstrates, there is a wide range of agents involved whose actions might bear some import on the overall work. But are these diverse personnel authors? And is authorship a meaningful vantage point from which to interpret these works? Some preliminary answers might be drawn from film studies, where debates concerning collaborative authorship have been especially prevalent. While the tasks involved in the production of a film (like a piece of recorded music) are often distributed amongst multiple individuals, theories of filmic authorship have often privileged a single authorial voice, whether real (as in the so-called “auteur theory” pioneered by French critics like André Bazin and François Truffaut, and the American Andrew Sarris) or constructed (as in theories of semiotics and post-structuralism). A number of contemporary film scholars, including Paisley Livingston, Berys Gaut, C. Paul Sellors, Sondra Bacharach, and

[55] “Waves Eddie Kramer Drum Channel User Manual,” accessed September 21, 2016, http://www.waves.com/1lib/pdf/plugins/eddie-kramer-drum-channel.pdf.
[56] “SSL 4000 Collection,” Waves, accessed September 21, 2016, http://www.waves.com/bundles/ssl-4000-collection#ssl-4000-collection-overview.

Deborah Tollefsen, hold that film authorship is no doubt multiple, but differ with regard to the criteria by which an individual can be attributed author status.[57] And even in situations where authorship is accorded to multiple individuals, that status is not necessarily equal. While actors, cinematographers, and so on might be the authors of their own contributions—and these may have a decisive influence on the aesthetic properties of the film as a whole—the director is still generally viewed as having an authorial status that surpasses any other contributor.

Sellors' principal contribution was to introduce a distinction between the material film and the filmic utterance. While the term "utterance" was already employed in Livingston's definition of an author, Sellors clarifies that "an utterance is not the *action* of intentionally expressing or communicating… but the *result* of doing so."[58] Modeling his usage of the term on the work of Paul Grice, for Sellors "an utterance is an intentional (purposeful), meaningful expression."[59] This distinction allows Sellors to differentiate between work that contributes to a film's material properties (such as a sound recordist who does a good job capturing dialogue in order to meet professional standards) and those that contribute to a film's utterance (such as a sound recordist who intentionally impinges on the quality of an audio track in order to "enhance the film's meaning").[60] The corollary here is that, while a film might contain a large number of what Sellors terms "authored components," not all of these components will play a significant role in determining the properties of the filmic utterance and, therefore, the authors of these components should not necessarily be granted (co-)author status of "the film" itself. While Sellors

[57] See, for example, C. Paul Sellors, "Collective Authorship in Film," *The Journal of Aesthetics and Art Criticism* 65/3 (Summer 2007): 263-71; Berys Gaut, *A Philosophy of Cinematic Art* (Cambridge: Cambridge University Press, 2010); Sondra Bacharach and Deborah Tollefsen, "*We* Did It: From Mere Contributors to Coauthors," *Journal of Aesthetics and Art Criticism* 68/1 (2010): 23–32; Paisley Livingston, "On Authorship and Collaboration," *Journal of Aesthetics and Art Criticism* 69/2 (2011): 221–5; and Sondra Bacharach and Deborah Tollefsen, "We Did It Again: A Reply to Livingston," *Journal of Aesthetics and Art Criticism* 69/2 (2011): 225–30.
[58] Sellors, "Collective Authorship in Film," 264.
[59] Sellors, "Collective Authorship in Film," 270.
[60] Sellors, "Collective Authorship in Film," 269.

acknowledges the potential for slippage between a reader's interpretation of the film and the meaning projected by its author(s), he is ultimately not concerned with reception; the properties of the filmic utterance are those determined intentionally by its author(s): "Without intention behind a work, we have no justification for interpreting it, as we have no distinction between the purposeful activity of text production and a chance occurrence of markings."[61]

But how can we pin down intention in any conclusive way? Indeed, much ink has been spilt critiquing the prospect that one might grasp the "truth" behind a work by psychologizing its author(s), making recourse to biography as an explanatory mechanism, or postulating a single, coherent author. Nonetheless, it is beyond the scope of this chapter to provide a comprehensive overview of the debates about authorship in literary criticism since Roland Barthes penned his famous essay, "The Death of the Author." Rather, I wish merely to borrow the crucial insight offered by Barthes and other French critics such as Jacques Derrida and Michel Foucault—divergent though they are in their conclusions—that authors and authorship are not pre-given. They are, rather, constructed. For the purpose of interrogating how authorship functions within 1960s rock culture, I find Foucault's analysis of the author function in his 1969 essay "What Is an Author?" to be particularly useful, as it helps to clarify how the name of the author can shape the reception of a work (which is an utterance), and therefore must be managed by those who produce it. As Foucault writes, "the author's name serves to characterize a certain mode or being of discourse… a speech that must be received in a certain mode and that, in a given culture, must

[61] Sellors, "Collective Authorship in Film," 264. While I find many of Sellors' points to be compelling, I find his separation between material and utterance potentially problematic without clearly delineating the object of study. For example, when discussing a recording, we need to specify whether the object of interest is purely aural, or if it also includes musical paratexts like album artwork. For example, while Richard Hamilton's stark, white cover for *The Beatles* (1968) constitutes an important authored component of the album-object, it is often missing from contemporary experiences of the album as digital audio; as such these two experiences of *The Beatles* might be said to constitute separate utterances, despite being referred to by a common name.

receive a certain status."[62] It is, therefore, an element of a predetermined, historically contingent discursive formation. In this regard, the ascription of author status is not so much an explanation of the conditions of a work's genesis but, rather, a "variable and complex function of discourse" that provides instructions about how the work must be received in a particular time and place.[63]

Despite his reliance on a stable notion of intention, Sellors' distinction between the material film and the filmic utterance, as well as his focus on authored components, can nonetheless provide a useful starting point for examining authorship in recordings of popular music. But if films are comprised of a variety of authored components of different natures, recorded music, by contrast, is comprised entirely of sounds. In the pages that follow, then, I will be concerned with elucidating the tension between two different conceptions of authorship: (1) a mechanism explaining the genesis of a work and (2) a mechanism for shaping the reception of the work. Given both the fundamentally collaborative nature of popular music production and the prestige reserved for the auteur in rock discourse, it will be important to interrogate both of these functions simultaneously in order to clarify the discrepancies between the actions that may be considered to yield popular music works and the actions that may be considered to be authorial.

I begin first by examining how authorship is made legible in popular music. Put another way: what does a popular music signature look like? Following this, I examine three case studies drawn from the late 1960s in order to interrogate how we conceptualize authorship and agency in the production of popular music through the lens of electrical instrument technologies. I explore some principal strategies used by rock musicians to communicate their authorial status, especially live performance; if the recording studio—itself an assemblage of technologies,

[62] Michel Foucault, "What Is an Author?", in *The Foucault Reader*, edited by Paul Rabinow (New York: Vintage Books, 2010), 107.
[63] Foucault, "What Is an Author?", 118.

techniques, personnel, and environment—allowed musicians to create works with little pretense to realism, live performance offered a forum for demonstrating that the sounds heard on record were (or at least could have been) produced by the people seen on stage. But the studio environment is much more easily controllable than the stage. As we will see, musicians often made aesthetic choices for their recordings with respect to what they could reasonably achieve live and even, in some cases, collaborated with sound engineers to expand what was possible in a live environment. If the study of popular music and technology has often focused on how recording has changed live performance, this study provides a necessary corrective to consider also how discourses of authenticity that place high value on live performance have also determined the content of recordings.

If live performance functioned as an important site for making authorship legible, it would seem reasonable that effects pedals like fuzz and wah-wah (both of which were new in the mid-1960s) would have been widely utilized by performers seeking to bridge the sonic gap between the recording studio and stage. Indeed, unlike many of the acoustic instruments heard on mid-1960s recordings (cello, sitar, and so on), effects pedals for electric and electronic instruments were easily adapted to live performance. However, for many critics, these technologies provided musicians with shortcuts to "awesome" sounds without developing the requisite talent necessary to produce them by "traditional" means. While such attacks were directed principally toward inexperienced musicians, these technologies were also employed by all of the major rock virtuosi of the day, who were celebrated for the innovatory performance styles that they developed in tandem with these devices. Here I focus on a collaborative relationship between Jimi Hendrix and Roger Mayer, an engineer who built and modified effects pedals that can be heard on many of the Jimi Hendrix Experience's recordings. If scholars have often discussed the encounter

between "hard wired" sound technologies—developed in a particular context toward a particular end—and (typically non-Western) users who either attempt to overcome the technology's "limitations" or tweak their music to fit what the technology authorizes, how do we account for situations in which musicians have direct access to individuals who can retool their equipment?[64] Indeed, evaluations of musical skill are predicated upon demonstrations of exceptional talent against a background of shared tools and materials. In this section, then, I examine how the collaborative relationships that yield significant authored components of recordings might incorporate personnel outside the usual distribution of labor encountered in a studio context.

In both of the preceding examples, I examine collaborative relationships with engineers who provide musicians with new equipment. While these engineers are not altering the sounds produced by musicians through the usual means—adjusting faders and knobs, placing microphones, patching signals into various devices, etc.—their equipment fundamentally alters a musician's experience of their instrument and, by correlation, the nature of the instrument itself. This dispersion of agency between human and non-human agents can foster a sense of disembodiment, that control over sound production is being outsourced beyond the performer's body. Ideas concerning non-human agency are often disconcerting for critics who place a high value on musicianship; if the sound of a performer is understood to be strongly determined by

[64] For a discussion of "hard wired" sounds, see Paul Greene's introduction to *Wired for Sound: Engineering and Technologies in Sonic Cultures*, ed. Thomas Porcello and Paul Green, 1-22 (Middletown, CT: Wesleyan University Press, 2005). Greene discusses the processes by which socio-cultural assumptions about the materials of music, its structure, its function, and so on are embedded into technological designs. Because the West has, for many years, functioned as the principal producer of electrical music technologies, the structures of its musics (its scales, performance gestures, etc.) can ultimately create barriers for musicians working in other traditions. As Greene writes: "For example, in most studio technology pitch is mapped out onto western equal-tempered scales, and it is often difficult to reconfigure the technology so that it offers easy access to pitches in non-western tunings, such as those of the Javanese *pelog* and *slendro* scales. And because the technology is based on the model of distinct pitch levels triggered by discrete keys (as on an electronic keyboard, which is based on the western piano), it is generally more difficult and complicated to perform or encode Indian *gamaks*—slides, trills, and other performative features—using western-designed technology." Greene, "Introduction," *Wired For Sound*, 5-6.

their equipment—and therefore reproducible by anyone with the same—what tenability remains for ideas such as mastery and virtuosity? Here I examine discourses rooted in the idea of discovering sounds as musicians interact with new musical technologies, and contemplate the relationship between an emergent musical praxis of "settings" (on amplifiers, effects pedals, etc.—the outsourcing of timbre-shaping action from a performer's body to electrical technologies with adjustable parameters) and criticism of presets in synthesizer-based music.

3.2: Authenticating Authorship in Live Performance

How is authorship made legible within the field of popular music? Generally speaking, this is facilitated by credits printed on a record's packaging or, more recently, written into the meta-data (such as ID3 tags) accompanying digital media. This can be highly problematic, however, as recording credits are rarely exhaustive. Indeed, oftentimes crucial personnel, especially session musicians, are omitted from this documentation. Furthermore, the credits are nearly always subsumed under the weight of the recording's attribution to a particular performing artist, an association that is strengthened by social practices of music organization and categorization observable in, for example, store layouts (whether in a brick-and-mortar or online store recordings, unlike films, are rarely organized by producer, engineer, etc.) and software design (the principal organizational hierarchy employed by major digital music retailers, such as iTunes and Spotify, is artist → album → song). But while credits might attest to the contributions that lead to the completion of a piece of recorded music, copyright law provides the basic mechanism for asserting and securing legal ownership, a right that is afforded to authors. Although it has been argued that the legal recognition of authorship does not necessarily reflect the actual circumstances of a work's genesis (an individual can be legally recognized as an author without

having executed any authorial acts) copyright nonetheless plays a role in announcing an individual's authorial status.[65] Put another way, if part of being an author is simply being recognized as one, then copyright, as well as a recording's attribution to a single performing artist, significantly facilitates that recognition.

Although sound recordings constitute the most widely experienced form of popular music, live performance functions as an important site for demonstrating that the sounds heard on a recording were actually produced by the people to whom authorship has been attributed. A highly demonstrative case is the November 19, 1990 retraction of Milli Vanilli's Grammy award for best new artist. After intense media scrutiny following a live performance in Bristol, CT that bore witness to a playback error in the pre-recorded vocal tracks (to which frontmen Fab Morvan and Rob Pilatus were lip-synching) it became clear that the vocal tracks attributed to Morvan and Pilatus on their recordings had actually been performed by other people. With several decades of precedent, the misrepresentation of authorship on popular music recordings was already, by 1990, an inveterate practice. And yet, in an interview with the *New York Times*, Michael Greene, then president of the National Academy of the Recording Arts and Sciences, which administers the Grammy Awards, indicated that the move to rescind the award was "predicated on a falsification of label credit"—exacerbated by their prominent place on the charts—and would likely have stood had the appropriate musicians been credited for the work.[66] Yet this move to acknowledge the ventriloquism at the center of the act is to misunderstand a critical dimension of the consumption of popular music; the experience of listening to a song like "Girl You Know Its

[65] The example of a song credited to John Lennon and Paul McCartney, but which was only written by one of them, is addressed in a number of recent studies of collaborative authorship. It has been debated especially by Livingston, Bacharach, and Tollefsen. See Bacharach and Tollefsen, "*We* Did It," 26, 32; and Bacharach and Tollefsen, "We Did It Again," 228.

[66] Jon Pareles, "Wages of Silence: Milli Vanilli Loses Grammy Award," *New York Times*, November 20, 1990, C15.

True" involves not only audition but also fantasy deeply connected to the assumed identity of the people being heard. To pull back the curtain and reveal the "real" musicians behind the song is to interrupt this fantasy.

As Paul Greene writes, "for many listeners an originary presence of actual voices, bodies, instruments, or performances is very important; it functions, in some sense, as an anchor, a guarantor of the recording's meaning and value."[67] Indeed, many musicians working in the mid-to-late 1960s were keen to ensure that this "originary presence" would be clearly perceptible should the curtain ever be pulled back. Two practices in common usage at this time proved to be especially pronounced sources of anxiety in this regard: (1) the employment of session musicians and (2) the usage of studio-based techniques that could not be reproduced in a live context. In the following pages, I examine the nature of these anxieties and elucidate different strategies that musicians employed in addressing them.

While hiring session musicians had long been a common practice in the production of popular music, it came to present new problems in an era that was increasingly dominated by groups rather than singers and which placed high value on autonomous production. Indeed, even though the success of singers (and singing groups) was dependent upon the work of studio musicians, it was rarely viewed as a threat to their credibility since it was assumed that these contributions would have to be made by someone.[68] Beat groups, by contrast, advanced a claim

[67] Greene, "Introduction," *Wired For Sound*, 10.

[68] There are many anecdotal references attesting to session musicians having furnished pop songs with their most aesthetically interesting features despite not receiving compositional credit. Indeed, the details of these arrangements were often worked out on the spot—even those that might seem to "define" a composition. Many efforts have been made recently to document the contributions of these musicians, including documentaries on the Funk Brothers (*Standing in the Shadows of Motown*, 2002), Fame Records (*Muscle Shoals*, 2013), and the Wrecking Crew (*The Wrecking Crew*, 2008). Carol Kaye, who worked for many years as a session guitarist and bassist and played on a number of major hits, has often spoken in interviews about the contributions of session musicians providing these defining features. With regard to Sonny & Cher's "The Beat Goes On" (1967), she explains: "it sounded like a nothing tune, a one-chord droning on 'song' with a boring dotted quarter, then eighth single-noted bassline.… I was playing a lot of bass dates already so automatically started to play several made-up basslines to see if I could come

that they themselves were responsible for the sounds heard on their recordings (e.g. the bassist produced the bass track, and so on). Yet this was not always the case. If groups like the Beatles and the Rolling Stones demonstrated the commercial viability of the group format, the vast majority of the mid-to-late 1960s beat groups that attempted to cash in were quite young and relatively inexperienced as professional musicians. Even good live bands could potentially flounder in a recording studio, an environment that presents a different set of challenges and requires a different set of skills than the stage. A *BI* editorial from 1968, discussing whether or not groups should say who played (and, by association, did not play) on a record, makes the stakes clear: "Most recording managers find that young, inexperienced instrumentalists often tend to get a fit of nerves the first time they go into a recording studio.… It is going to cost a bomb if just one instrumentalist starts making mistakes."[69] Session musicians, then, allowed record companies to launch new groups who were not (yet) capable of fully realizing their music on record while neither breaking the bank nor disrupting the group's identity (including the members' appearances, personalities, interpersonal dynamics, and so on—no doubt key aspects of their salability).

But even if a group could not play well enough to generate a recording themselves, their identity as a group was a crucial selling point in the popular music marketplace of the 1960s. The Byrd's recording of "Mr. Tambourine Man" from 1965 is a telling example. As Theodore

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up with a rabbit out of a hat for this dog of a tune. About the fourth or fifth line, I came up with the line you hear today. And I do credit Sonny stopping the band and saying, 'That's it, Carol. What's that line you're playing.'… You would know why I think the bassist is the really the arranger of the band. It made the tune happen, and of course made some loot for Sonny & Cher (and a few dimes for the musicians)." The dynamics here—with Kaye inventing a part and Bono selecting it—highlight the degree to which musicians themselves can be instrumentalized by auteur figures. Different genres of music favor different kinds of working methods and, as such, do not accord equal privilege to all efforts involved in a production when considering authorial status. See Steve Marinucci, "Carol Kaye on bass, Brian and the Beach Boys," abbeyrd.net, accessed January 29, 2017, http://www.abbeyrd.net/carolkay.htm.

[69] "Editorial," *Beat Instrumental* 59, March 1968, 2.

Gracyk writes concerning the Wrecking Crew-provided backing, the record "represented the ideal Byrds performance before the members of that group were capable of performing at that level."[70] Even though the group members did not play their own parts on the record—with the exception of Roger McGuinn's electric 12-string guitar as well as his and David Crosby's vocals—their visual presentation, especially on television, depicts them as instrumentalists. Indeed, the group mimed performances of "Mr. Tambourine Man" along to the record on programs like *Shivaree* and *Hullabaloo*, occasionally with live vocals, as was common practice for the period. While the group could have "performed" the song on television without miming with their instruments, doing so would have more strongly articulated them as a singing pop group (in the vein of Sonny & Cher or the Walker Brothers) rather than a nascent folk-rock band. Even though the Byrds would quickly assume the level of musicianship required to perform on all of their subsequent recordings, the use of session musicians on "Mr. Tambourine Man" allowed them to position themselves as one of the first folk-rock bands, making a claim to artistry by fusing aspects of both rock 'n' roll and folk music.

In both of these cases session musicians were tasked with providing a performance that members of the group could not (yet) themselves perform *on the same instruments that the band played themselves*. But as the sonic palette of popular music expanded throughout the course of the decade, session musicians were often tasked with providing performances on instruments that no one in the group knew how to play. The sitar, as discussed in the previous chapter, was a prominent example of this. The Yardbirds, for example, hired a session musician to perform a sitar part on "Heart Full of Soul" before scrapping the idea and replacing it with a distorted guitar part played by Jeff Beck. The complex arrangements heard on many recordings from the

[70] Gracyk, *Rhythm and Noise*, 95.

second half of the decade created session work for a variety of musicians with technical skills beyond the rock instrumentarium. But it also pushed musicians to learn new instruments so that they could reproduce their hits on stage without having to hire additional musicians to join them, which would potentially threaten the integrity (and commercial viability) of the group's identity. Harry Vanda, lead guitarist for an Australian beat group called the Easybeats, for example, started taking cello lessons from a teacher at London's Royal College of Music in order to reproduce the part heard on their 1967 single, "The Music Goes Round My Head."[71]

The late 1960s also bore witness to an increase in the prominence of multi-instrumentalists in pop groups. The Rolling Stones' Brian Jones is one of the principal examples of this type of musician; the eclectic sound palette of their recordings from this period is in large part attributable to his skill, however modest, on a variety of disparate instruments, including sitar and dulcimer. Another group that featured a multi-instrumentalist was Dave Dee, Dozy, Beaky, Mick and Tich. As Beaky, officially the group's rhythm guitarist, told *BI* with regard to his effort to learn the accordion part heard on "Okay" (1967): "A session man handled it on the record but our rule is that we go all out to produce hit record sounds on stage."[72] Yet it was the Moody Blues who were perhaps the most famous for being a group with pronounced multi-instrumental talents. *BI* reported in August 1968 that the group "play a total of more than 30 instruments between them," eliminating the need for session musicians to contribute to the variety of sounds heard on albums like *In Search of the Lost Chord*.

Session musicians, then, could be used to fill a variety of production needs, from providing solid takes of a part in lieu of a novice musician to enhancing a group's basic sound with more

[71] "Instrumental News," *Beat Instrumental* 57, January 1968, 28.
[72] Pete Goodman, "What's a Lead Bass Player?", *Beat Instrumental* 64, August 1968, 8.

elaborate instrumentation, often drawing from far outside the relatively narrow bounds of the rock instrumentarium. But, as many critics have noted, the most enduring legacy of 1960s popular music production was an increased reliance on and exploitation of techniques afforded by the recording studio. The use of new electronic instruments and tape-based editing techniques, many of which had explicit connections to the classical avant-garde, lent credibility to the argument that the artistic value and prestige of popular music was on the rise. But the studio's affordances were highly polarizing. Even as many fans and critics waxed lyrical about the advances in "progressive" music furnished by studio technology, dissent was just as widespread. Indeed, while recording technologies and techniques allowed musicians and their production crews to create recordings that made little claim to document "real" performances, live performance was still held by many to be an integral part of a popular musician or group's practice and recordings, however outré, remained the metric by which a performance would be judged.

One of the principal obstacles preventing the full recreation of studio productions during a live performance were the limitations of the period's technologies of sound reinforcement, especially public address (PA) systems. Such systems were limited by volume, both for the audience and, in an era before widespread adoption of stage monitoring, the performers. Stories of the Beatles being drowned out by screaming fans—and, therefore, being unable to sing complex vocal arrangements on songs like "Nowhere Man" with proper intonation for want of hearing themselves—are a central moment in many histories of popular music, as they are understood to have triggered their retirement from live performance and subsequent studio reclusion. Whatever their veracity, these stories speak to what was then a palpable and growing rift between these two sites of popular music practice. As Susan Schmidt Horning writes in

Chasing Sound, "by the mid-1960s it was clear that recorded sound had far outpaced live sound reinforcement, challenging musicians and engineers to deliver live sound comparable to the record."[73] This discrepancy was borne out in two principal ways. First of all, as is well established, records provided an opportunity to create unrealistic acoustic situations. The crooning style of vocalists like Bing Crosby and Rudy Vallee is frequently cited as an early example of the possibilities inherent in an approach to recording that does not seek to document a real event.[74] Rock musicians' juxtaposition of harpsichords, sitars, cellos, dulcimers, and countless other acoustic instruments against drums and amplified guitars can be read as a continuation of this practice. When these musicians attempted to recreate these sounds live, engineers needed to develop speaker and microphone designs (as well as techniques of placement) that could provide greater amplification without experiencing feedback. Secondly, when rock musicians began to experiment with echo, reverberation, and *musique concrète*-style tape collage, they needed mixing consoles and multi-speaker arrays that could be used to recreate these effects.

Throughout the 1960s it could not be taken for granted that a venue would provide PA equipment. While some of the major rock venues, such as the Fillmore, provided a house PA system, oftentimes bands would be responsible for providing their own amplification, which could be quite inadequate.[75] As an anonymous interviewee in John Ryan and Richard A.

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[73] Horning, *Chasing Sound*, 218.

[74] See, for example, Paula Lockheart, "A History of Early Microphone Singing, 1925-1939: American Mainstream Popular Singing at the Advent of Electronic Microphone Amplification," *Popular Music and Society* 26/3 (2003): 367-385.

[75] The dearth of information on the development of live sound reinforcement is a serious lacuna in historical work on the history of music and technology. Musician-oriented magazines have occasionally printed features on the history of the PA system, but these typically focus on the spectacular developments of the 1970s, which featured the massive touring rigs of bands like The Who and the Grateful Dead, as well as the engineers who rose to prominence at that time, such as Bob Heil. See, for example, Dan Daley, "The Night That Modern Live Sound Was Born: Bob Heil & The Grateful Dead," *Performing Musician*, December 2008, accessed January 29, 2017, http://www.performing-musician.com/pm/dec08/articles/bobheil.htm; and Andy Coules, "The History Of PA, Part

Peterson's "The Guitar as an Artifact and Icon" tells it, describing a performance from 1965, "We had no PA system; I sang through a mike plugged into my cheap little amp; that was not unusual then."[76] Indeed, repurposing amplifiers intended for purposes other than vocal sound reinforcement was common, especially in the first half of the decade. The Detours, for example, who later became better known as the Who, employed both hi-fi and guitar amplifiers for their vocals until 1963.[77] The distinction between instrument amplifiers and a PA system—which today might provide reinforcement for many sound sources, but is nearly always tasked with vocal amplification—emerged only gradually over the course of the decade.[78] As late as 1968, for example, ex-Animal Alan Price could be found employing ten Vox AC30 guitar amps for this purpose.[79]

The idiosyncrasies of the era's sound reinforcement, then, left a decisive mark on the instruments that could be used to good effect in live performance. While acoustic instruments like the sitar and the cello proved popular on recordings, their relatively quiet sounds were difficult to amplify to the level of drums and electric guitars without causing disruptive feedback. Harry Vanda, for example, the aforementioned Easybeats guitarist, was ultimately besieged by feedback problems when he attempted to incorporate a cello into the group's live set in 1968.[80] While successful groups like the Who and the Grateful Dead were collaborating with sound engineers to devise PA systems that increased volume while reducing feedback—often through

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1," ProSound Web, December 9, 2014, accessed January 29, 2017, http://www.prosoundweb.com/article/the_history_of_pa_part_1/. By contrast, there is far less literature concerning the practical realities of musicians working below the very top of the popular music economy.

[76] John Ryan and Richard A. Peterson, "The Guitar as an Artifact and Icon," in *Guitar Cultures*, ed. Andy Bennett and Kevin Dawe (Oxford; New York: Berg, 2001), 91.

[77] "The Who's PA: 1963-1966," Whotabs, last updated October 6, 2014, accessed September 10, 2016, http://www.thewho.net/whotabs/gear/pa/pa6366.html.

[78] By the end of the 1960s, bands with high-powered PA systems were also using them to amplify the drums.

[79] "More groups choose Vox," *Beat Instrumental* 65, September 1968, 29.

[80] "Easybeat plays cello," *Beat Instrumental* 64, August 1968, 29.

the use of careful speaker placement and techniques involving phase cancellation—these systems were prohibitively expensive and their technological innovations were slow to trickle down to smaller groups and venues. In a *BI* profile from 1971—the same year that the Who abandoned the British electronics firm WEM in favor of a collaboration with the American engineer Bob Heil, the result of which was an incredibly powerful PA system valued at £20,000—Jack Lancaster, one-time member of Blodwyn Pig, discussed the challenges of amplifying acoustic instruments like the cello on stage:

> We had to abandon acoustic instruments on stage because we found you have to play at a certain volume to get across, which means that things we are planning to do on record can't be done on stage, which is a bit of a drag. For instance Dave [Cakebread] really can *play* cello instead of just play *about* with it, but we can't use it on stage until we can afford some kind of electric instrument. They have electric cellos in the States but even then you would never get the true pure tone of a real cello.[81]

Lancaster's point about the tonal differences between an acoustic and an electric cello is striking. If the amplification provided by a PA system cannot provide a cello with enough volume to be heard without causing feedback, then the instrument itself can be adapted to the circumstance, typically by reducing the size of (or completely eliminating) the instrument's resonant chamber, similar to a solid-body or semi-hollow body electric guitar. Yet, as Lancaster points out, such modifications have a profound effect on the overall sound of the instrument. While the resonant chambers of acoustic instruments do provide amplification, their dimensions

[81] "Jack Lancaster," *Beat Instrumental* 99, 1971, 27.

and materials strongly shape the timbre of those instruments, too. Indeed, this problematic is a testament to the extreme mutability of an instrument-assemblage's emergent capacities as its components shift, even when two competing designs are oriented toward achieving a similar result. That is, while the designs of both an acoustic instrument with a resonant chamber and an electric instrument with a pickup prioritize amplification, the resultant effects on the instrument's other properties (tone, feel, size, etc.) may ultimately be rather different. As such, perhaps barring access to the era's most cutting-edge, custom-made PA systems, the use of these instruments in a live rock performance was simply not possible without sacrificing some degree of the acoustic instrument's tonal integrity, as it could be captured on record.

In addition to the troubles experienced balancing acoustic and electric instruments in live performance, musicians also encountered difficulty recreating special studio-based effects, which often involved tape playback or tape-based effects like phasing. Horning cites the Hohner Echolette as an example of a commercial product intended to bridge this gap. Featuring reverberation and echo effects built into an 80-watt amplifier, the Echolette was a rather modest PA that purported to offer "recording studio sound." Touted as a "complete portable sound studio," Hohner's advertisements for the device emphasized its capability to instantly improve the sound of its users: "You get a lot more out of this Hohner Echolette Sound System than you put into it." While none of the Echolette's features were new, their synthesis in a single unit and accompanying rhetoric spoke directly to concerns in rock discourse that were coming to a head just after the Summer of Love. But with the system's low wattage and amateur-oriented advertising rhetoric, it is unclear if Hohner ever intended for professional rock musicians—who were leading the charge in studio experimentation at this time—to comprise the Echolette's principal market. The amateur-oriented sales pitch was further corroborated by advertisements

for the device in publications like *Billboard* and *Guitar Player*, which included endorsements from players like Al Hirt, a trumpeter and bandleader famous for his saccharine pop-jazz arrangements of songs like "Java" (1963).[82]

Indeed, commercially marketed all-in-one PA systems with special effects like the Hohner Echolette appear to have been the exception rather than the rule in the second half of the decade. Rather, many of the top rock acts from the latter half of the 1960s commissioned custom PA systems from electronics companies like WEM, Vox, and Orange in order to partially bridge the sonic gap between their recorded output and live performances. While louder volume, improved throw, and reduced feedback would remain central concerns for PA design, many of these custom systems also attempted to successfully integrate effects such as spatialization, echo, and tape playback. Pink Floyd, for example, employed a quadrophonic system for their famous 1967 Games For May concert at the Queen Elizabeth Hall. The system was controlled by a simple panning device called the "Azimuth Coordinator" devised by an engineer at Abbey Road called Bernard Speight.[83] In 1970 the Who, as well, were reported to have commissioned a twenty-channel mixing desk from Allen and Heath with outputs to support quadrophonic sound diffusion.[84] One of the most elaborate PA systems yet devised was commissioned by the band Traffic. As *BI* described it in their Instrumental News section:

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[82] Cork Marcheschi, a member of the experimentally inclined San Francisco-based psychedelic rock band Fifty Foot Hose, made use of a Hohner Echolette in his first electronic instrument setup. I discuss Marcheschi in greater detail in the following chapter. See also Mark Brend, *The Sound of Tomorrow: How Electronic Music Was Smuggled into the Mainstream* (New York; London: Bloomsbury Academic, 2012).

[83] Mark Cunningham, "'Welcome to the Machine' The story of Pink Floyd's live sound: PART 1," *Sound on Stage* 5, March 1997, accessed September 10, 2016, http://pfco.neptunepinkfloyd.co.uk/band/interviews/art-rev/art-sos1.html.

[84] "Who's PA goes quadrophonic," *Beat Instrumental* 86, June 1970, 52.

> It will take 20 mikes all in line with separate treble, bass and echo controls on each channel. There is also facility to mike all instruments and still have channels available for vocals and playback from tape and special effects.… A special feature incorporated in the mixer is a facility to actually move the sound balance between the three sets of speakers. For instance, if the speakers are set out two at the back of the ball, two in the middle and two on stage, then the sound can be switched in stages through each pair giving the effect of a choir singing and walking down the aisle of a church.[85]

Published in the autumn of 1967, the high-tech concept behind Traffic's PA demonstrates an assumed interest among fans of rock music for concert experiences that recreated the fantastical, otherworldly sound environments heard on record—perhaps even, as with respect to the novelty of spatialization, surpassing them. But while such efforts constituted some of the most sophisticated attempts to translate the affordances of the recording studio back into a live environment, many of the era's top groups focused on re-arranging their songs to suit the constraints of the available sound reinforcement. While it is difficult to postulate any overarching statements about this practice, performing a song live without the same arrangement as a recording suggests that details of instrumentation and sonic texture might be less essential to the identity of a piece than its melody and harmony. I would suggest, however, that such modifications depend upon a variety of factors, including a song's popularity, the general affect of a group's live show, the prevailing musical trend(s) during the period in question, and of course the specific sonic detail under consideration. For example, the Rolling Stones have performed "Paint It Black" live without Brian Jones' original sitar part many times, with Ronnie

[85] "Traffic's New P.A.," *Beat Instrumental* 53, September 1967, 24.

Wood playing either an electric guitar or an electric sitar in its place. Similarly, the group has performed "Lady Jane" live with acoustic guitars in lieu of Jones' dulcimer. By contrast, songs like "In Another Land," the lead single from *Their Satanic Majesties Request* (1967), which prominently features vocal effects and unusual instruments, has been largely (if not entirely) absent from their live sets. But while the most interesting features of "In Another Land" may have been less amenable to the stage, other factors have also likely impacted the group's choice to avoid playing it live, including its lower chart position and that it features bassist Bill Wyman on lead vocals. Furthermore, the group's live sets at this time period, as documented in films like *Gimme Shelter* (1970) and albums like *Get Yer Ya-Ya's Out! The Rolling Stones in Concert* (1970), tend to emphasize the group's blues-based repertoire over their more psychedelic numbers. A similar point may be observed with the Who, whose earliest live albums were also released in 1970. These recordings, including *Live at Hull 1970* and *Live at the Isle of Wight Festival 1970*, tended to feature songs from the recently released *Tommy* and earlier, pre-psychedelia favorites like "My Generation" and "Substitute" rather than the more experimental *The Who Sell Out* (1967). Studio-based effects, such as the reversed guitar solo at the end of "Amazing Journey," could be overlooked in live performance without doing irreparable damage to the integrity of the piece.

Nonetheless, such flexibility in the live interpretation of recorded works was not universally embraced by rock musicians. Indeed, several other groups took a hard line against any such electrical "gimmicks" and suggested that any appreciable gap between the sound of record and a live performance of the same song implied compensation for bad technique. For example, John Alcock of the youthful London band Universe, whom *BI* deemed "competent musicians" with "principals [sic] and ideas worthy of more experienced players," articulated

himself as something of a purist by virtue of "[refusing] to use any effects, such as wah-wah or fuzz."[86] One of the most outspoken proponents of this back-to-basics, what-you-hear-is-what-you-get approach to record production was drummer Carmine Appice of the group Vanilla Fudge. While the group's success was relatively modest, they were widely lauded for their musical skill following the 1967 release of their cover of Holland, Dozier, and Holland's "You Keep Me Hangin' On," originally recorded for Motown by the Supremes in 1966, which featured an elaborate hard-rock arrangement of the song. Although the group described themselves as "psychedelic symphonic rock," and although reviews of their work suggested exploitation of studio effects, Appice was clear about the group's approach and values:

> We use just guitar, organ, bass and drums. We're kicking against the phony instrumental sounds created in studios.… We believe implicitly that a group should be able to do on stage what it does in a studio. Our aim simply is to develop to the ultimate of what you can get out of four-piece group without resorting to any gimmicks at all. Using echo is about the only thing we add, but we can re-create that effect on stage. Everything else is positively out. If people say, as they do, that we sound like we had eight musicians, then that's a tribute to our musicianship, not to an engineer's ingenuity.[87]

Appice's pronouncement proffers a number of insights into his group's value system. First of all, it posits realism as the ideal of rock recording aesthetics. As Gracyk has written, "To a stubborn realist, overdubbing and multitrack recording are basically gimmicks or shortcuts. Jazz

[86] S.H., "Universe on top of the world," *Beat Instrumental* 96, April 1971, 58.
[87] "Vanilla Fudge tour," *Beat Instrumental* 54, October 1967, 24.

purists seem particularly disposed to regard splices and overdubs as a cheat."[88] Although Vanilla Fudge may nonetheless have employed these techniques in the production of their self-titled 1967 debut, *Vanilla Fudge* aestheticizes neither the affordances of multitrack recording nor the otherworldly effects available through, for example, tape manipulation. Their overt rejection of "phony" sounds, as well as the nature of the content on the album, holds the recording event as more documentary than compositional in function and thus suggests that listeners should judge their recordings by the same criteria as live performances. Secondly, it delimits a strict hierarchy with regard to the significance of the contributions made by the various people involved in producing a recording. While engineers are necessary for making records, they should not be responsible for determining a work's most significant aesthetic features, as this would obscure our ability to judge the merit of the performing artist, whom we should regard as the principal author of the piece. Finally, it establishes a narrowly defined set of instrumental resources for the performing artist to exploit in producing their work. Put another way, by consciously limiting their instrumentation to guitar, organ, bass and drums—what I have defined elsewhere as the basic rock instrumentarium—and insisting upon the transparency of personnel like recording engineers, Vanilla Fudge are establishing a framework for understanding their musicianship. Because of the high value placed on musicianship by performers like Appice this rhetorical move, in turn, delimits the aesthetic values for judging their music as a whole.

[88] Gracyk, *Rhythm and Noise*, 40.

3.3: Jimi Hendrix and his "Organisation"

"The ensemble's instruments are much amplified by electronic means unknown to Beethoven, and my eardrums received a not inconsiderable buffeting from the waves of sound, from which there was no escape."[89]

Like Carmine Appice and Vanilla Fudge, Jimi Hendrix, Noel Redding, and Mitch Mitchell—collectively known as the Jimi Hendrix Experience—were likewise wary of pursuing sonic novelties in a studio environment that could not be recreated live. As Redding put it to *BI* in November of 1967, "We do have one positive rule. We just have at least one new sound on each record, and we must be able to reproduce it completely on stage."[90] But, as the parodic epigraph above highlights, a crucial aspect separating the Experience's approach from that of the majority of their peers was their unabashed embrace and exploitation of the full range of possibilities inherent in a variety of new electrical instrument technologies, including amplifiers and effects pedals, as well as the electric guitar and bass.[91] The Experience's artistic goals, then, blended aspects of aesthetic conservatism (recording realism) with a modernist brand of progressivism (creative use of technology to pursue new sounds). The *BI* article continues by framing this aspect of the Experience against their peers' proclivity toward novel instrumentation (which I have discussed in greater detail in chapter two), and is worth quoting in full:

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[89] "Hendrix Live," *Beat Instrumental* 65, September 1968, 13.
[90] "'English Studios Are as Good as American,' say Experience," *Beat Instrumental* 55, November 1967, 4.
[91] That being said, Hendrix himself often maligned critics that, in his words, "wrongly accused" the Experience "of being just an electronic group." See Pete Goodman, "Jimi's Own Electronic Wizard!!!", *Beat Instrumental* 57, January 1968, 13. Although Hendrix's discussion of his approach to the electric guitar often focused on amplifiers and dedicated effects units, he occasionally described novel manipulations to the guitar itself. For example, in an interview with Klas Burling, a Swedish radio DJ, he explained: "I play a Fender Stratocaster guitar, and you can take the back off. A little small plate and you can tap the springs. There's little springs back there. And it makes these weird little sounds sometimes." See Klas Burling, "Interview with Jimi Hendrix," in *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix*, ed. Steve Roby (Chicago: Chicago Review Press, 2012), 40.

> While other groups are using sitars, African drums, harpsichords, and various other instruments, the Experience rely on Jimi to create new sounds with just his guitar. I asked Noel if he thought that they might exhaust ideas, unless they used different instruments. "I don't think so," he said, "Jimi likes experimenting. He's always looking for new ideas. Using either a Wah-Wah pedal, foot tone control or combination of both, he extracts some very weird sounds from his guitar. And with my bass, which I have on full treble, we can obtain a tremendous variety of effects in the recording studio and on stage."[92]

In a marketplace hungry for both new sounds and stars authenticated according to Romantic conceptions of individual genius and creativity, the Experience was uniquely positioned. Hendrix, well-aware of his British colleagues' use of everything-but-the-kitchen-sink instrumentation, expressed concern that recordings by his group might be evaluated in similar terms, therefore missing their real significance. In an uncredited 1967 piece from *Record Mirror*, Hendrix says of his then-upcoming single, "Purple Haze": "I think everyone will think we've used different instruments on it, but it's still two guitars and drums—at one point the guitar sounds like a flute. I recorded it exactly as we do it on stage."[93] But how did Hendrix make his guitar sound like a flute in the first place? His guitar solo on "Purple Haze," the section of the song to which Hendrix is referring in the previously quoted passage, is unique for being the first recording to feature an effects pedal called the Octavia, which reproduces the input signal at either an octave above or below its original pitch. In so doing, Hendrix was able to play highly florid lines that would have been nearly impossible to double simultaneously at the octave.

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[92] "'English Studios Are as Good as American,' say Experience."
[93] "Jimi Doesn't Think He's a Big Name Yet," *Record Mirror*, February 25, 1967.

While such an effect could have likely been achieved with multi-tracking, the Octavia allowed Hendrix to make a claim to realism, as he could reproduce it live.

When Hendrix first employed the Octavia on "Purple Haze," the unit was not commercially available. Indeed, the Octavia was given to Hendrix by its inventor, an acoustics engineer working for the British Admiralty named Roger Mayer. Although Mayer was at that time in government employ, he had already established a relationship with several prominent British guitarists in the beat scene—including Jimmy Page, Jeff Beck, and Big Jim Sullivan—who he furnished with guitar effects units as early as 1964. After making contact with Hendrix at a gig in early 1967, Mayer became a close associate of the Experience. In a *BI* piece tellingly entitled "Jimi's Own Electronic Wizard!!!", Hendrix describes both Mayer's relationship to the group and his rationale for not identifying Mayer by name: "He is an electronics man working in a Government department. He probably would lose his job if it was known he was working with a pop group. But he's very much a part of our organisation now—he comes up with a lot of ideas."[94]

What were the nature of these ideas? In subsequent interviews Hendrix would remain relatively mum with regard to the nature of Mayer's contributions to the group.[95] In Mayer's own telling, however, he was present for the vast majority of the recording sessions that furnished the material for the Experience's second record, *Axis: Bold as Love*, and played a collaborative role in producing the "unique tones" audible on it.[96] This work included fashioning a number of updated versions of the Octavia pedal, as well as building and modifying distortion effects.[97]

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[94] Goodman, "Jimi's Own Electronic Wizard!!!".
[95] In an interview with Jay Ruby, Hendrix mentions that Mayer provided a track of him stomping his feet on a wooden platform for the song "If 6 Was 9." See Jay Ruby, "Interview with Jimi Hendrix," in *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix*, ed. Steve Roby (Chicago: Chicago Review Press, 2012), 90.
[96] Roger Mayer, "History," Roger Mayer, accessed September 26, 2016, http://www.roger-mayer.co.uk/history.htm.
[97] Roger Mayer, "Octavia," Roger Mayer, accessed September 26, 2016, http://www.roger-mayer.co.uk/octavia.htm.

This latter task involved studying other pieces in Hendrix's rig—such as the Arbiter Fuzz-Face, a fuzz pedal that the guitarist favored—in a variety of usage contexts and designing more robust versions. In an interview with *Premier Guitar*, Mayer discussed the wildly fluctuating values of components manufactured in the 1960s and used in pedals like the Fuzz-Face.[98] Due to these inconsistent values each instantiation of the circuit could sound markedly different. Indeed, Mayer has noted that "it was not unusual to have to select from up to 20 units to find a really good one. No two units were the same!"[99] And, even when a good-sounding unit could found, the tonal character of the Fuzz-Face's temperature-sensitive germanium transistors could ultimately be rendered unworkable by the unpredictable nature of stage performance. Thus, in addition to providing Hendrix with original effects not available to other guitarists, Mayer also ensured the regular functioning of other pieces of equipment integral to Hendrix's sound, which enabled the guitarist to make good on the promise that "what we want to produce in the studio is what we want to produce on stage."[100] In these respects, the role occupied by Mayer combined certain of the responsibilities normally assigned to a guitar tech (maintaining equipment), a recording engineer (devising technical solutions to solve aesthetic problems), and an instrument builder (literally building new instruments, such as the Octavia).

Hendrix was nothing if not confident about his artistic vision for his recordings. In a 1968 interview with Jacoba Atlas he claimed, in no less certain terms, "I know exactly what I want to do. I know exactly what I want to hear."[101] As such, he expressed an often-ambivalent attitude

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[98] Tom Hughes, "Roger Mayer Talks Fuzz," *Premier Guitar*, July 20, 2010, accessed September 26, 2016, http://www.premierguitar.com/articles/Roger_Mayer_Talks_Fuzz.
[99] Roger Mayer, "Classic Fuzz," Roger Mayer, accessed September 26, 2016, http://www.roger-mayer.co.uk/classic.htm.
[100] Goodman, "Jimi's Own Electronic Wizard!!!".
[101] Jacoba Atlas, "A Jimi Hendrix Doubleheader," in *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix*, ed. Steve Roby (Chicago: Chicago Review Press, 2012), 143.

toward individuals who effected some sort of mediation between his vision and his audience. On the one hand, he often spoke negatively in interviews about how the music that appeared on record did not reflect what had been achieved in the studio, perhaps as a result of commercial (rather than artistic) imperatives, or by virtue of inadequate recording technology and technique.[102] But, on the other hand, Hendrix could be equally effusive about certain approaches toward recording. When comparing British recording engineers against those in the United States ("Over here, all an engineer does is his thing. He's a complete machine, just like the tape recorder he's working."), Hendrix celebrated the former's creative faculties:

> In London, they have less equipment and it's not as good as the equipment they have here. Therefore, they work twice as hard. Even the engineers are involved in getting the best for you. Which is good. They have more imagination over there. It's groovy. Even the limitations are beautiful because they make people really listen—and the people are very, very, very good.[103]

Despite the adulation, it is clear that Hendrix's conception of the engineer's role is primarily service-based ("getting the best for you") rather than creatively motivated in its own right. And, throughout most of his career in the late 1960s, Hendrix did not openly acknowledge

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[102] Hendrix often discussed having to shorten his work to conform to the single format dominant at the time. Indeed, while Hendrix was dismissive of artists who pursued overly long tracks for the sake of it, he often felt that his own artistic goals necessitated space beyond what was offered on a single. "Purple Haze," for example, was meant to be much longer, containing—in its original version—a "thousand words," which—by Hendrix's estimation—were necessary to create the effect described by the title. See Meatball Fulton, "Interview with Jimi Hendrix," in *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix*, ed. Steve Roby (Chicago: Chicago Review Press, 2012), 80-81. In the same interview Hendrix expresses his low esteem for the quality of sound on his first album. When Fulton asked, "How are you satisfied with the recording techniques generally?", Hendrix responded plainly: "Not at all." See Fulton, "Interview with Jimi Hendrix," 78.

[103] Atlas, "A Jimi Hendrix Doubleheader," 144.

the contributions of the engineers with whom he worked—principally Eddie Kramer, who served as engineer on all three of the Experience's studio albums, and the aforementioned Mayer. (In the history told through Steve Roby's edited collection of interviews with Hendrix, *Hendrix on Hendrix*, Kramer and Mayer literally occupy the status of footnotes.)[104] A telling example comes from a 1968 *Jazz & Pop* press conference with Jay Ruby, an anthropologist at Temple University in Philadelphia. When Ruby asked Hendrix, "When you record, who does what you call the gimmicks?", Hendrix replied:

> All those things are our own mind... all those things are coming out of us. We do a lot of things. Like, on the last track of the last LP ["Bold as Love"], it's called phasing. It makes it sound like planes going through your membranes and chromosomes. A cat got that together accidentally and he turned us on to it. That's the sound we wanted, it was a special sound, and we didn't want to use tapes of airplanes, we wanted to have the music itself warped.[105]

But while Hendrix no doubt had a penchant for finding poetic language to describe the sounds he conjured up in his mind, a footnote supplied by Roby leaves no doubt that the "cat" that actually produced the phasing effect was Kramer. Indeed, bassist Noel Redding was emphatic about how little the group was involved in producing such effects: "If a phase effect was wanted the engineer… would send us to the pub for an hour while they set up the slightly out-of-sync

[104] Steven Roby, ed., *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix* (Chicago: Chicago University Press, 2012), 95n3.
[105] Ruby, "Interview with Jimi Hendrix," 94.

interaction between two recorders which resulted in the effect."[106] While Hendrix often described the work done by his engineering staff, it was not until his February, 1970 interview with *Rolling Stone*—one of his last major interviews before his death in September of that year—that he confirmed Kramer's creative contribution by naming him. When asked, "The last record [*Electric Ladyland*] listed you as producer. Did you do the whole thing?", Hendrix replied: "No, well, like Eddie Kramer and myself. All I did was just be there and make sure the right songs were there, and the sound was there."[107]

In *Rhythm and Noise*, Theodore Gracyk highlights the disjunction between the materials suggested by Hendrix's work as a performer and his studio collaborations with Kramer. Given the plethora of depictions of Hendrix as an energetic, captivating guitarist, Gracyk wonders if his audience can accommodate a different vision of him: "how many Hendrix fans have a mental image of Hendrix sitting at a console, twiddling dials and constructing overdubs, painstakingly constructing the music, edit by edit? How many think of Eddie Kramer as a contributing artist?"[108] The gap between these two Hendrixes was something maintained by the guitarist himself in his selection of repertoire for stage performance. If the tracks recorded for *Axis: Bold as Love* and *Electric Ladyland* took ever greater advantage of the recording studio assemblage as an instrument (as well as Kramer's ability to exercise its capacities), then the overwhelming absence of these songs from his set lists is a testament to this split in his craft. Although some of the harder-hitting numbers from these records ("Voodoo Chile," the Dylan-penned "All Along the Watchtower," "Spanish Castle Magic") remained staples of his late performances, the vast

[106] Noel Redding and Carol Appleby, *Are You Experienced?: The Inside Story of the Jimi Hendrix Experience* (New York: Da Capo Press, 1996), 55.
[107] John Burks, "The End of a Big Long Fairy Tale," in *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix*, ed. Steve Roby (Chicago: Chicago Review Press, 2012), 261.
[108] Gracyk, *Rhythm and Noise*, 77.

majority of his live repertoire was comprised of songs from *Are You Experienced* ("Purple Haze," "Fire," "Foxey Lady," "Stone Free," "Red House"); contemporary hits by other artists ("Sgt. Pepper's Lonely Hearts Club Band," "Sunshine of Your Love," "Like A Rolling Stone"); his provocative rendition of "The Star-Spangled Banner"; and blues-based numbers that afforded long-form improvisation and jamming, some of which were released on his 1970 live album *Band of Gypsys* ("Machine Gun," "Message to Love"), while others went unreleased until after his death ("Freedom," "Hear My Train A Comin'").[109] This division in Hendrix's output between stage and album material was corroborated by the general lack of any major studio processing on his singles, which remained an integral part of his live performances.[110]

As the examples of Kramer and Mayer demonstrate, many of the significant aesthetic features of the Experience's recorded output were achieved in collaboration with individuals that, while they might be part of the "organization," were not regarded as proper members of the group. While both individuals have subsequently articulated claims of authorship to certain components heard on these recordings, they are not commonly regarded as their authors, a status typically reserved for the Experience, if not solely Hendrix himself. While Kramer's

[109] In 1969 Hendrix purchased a Univox Uni-Vibe pedal, which would allow him to translate some of the phasing effects produced through the manipulation of tape into a live environment. The effect is an integral component of the guitar sound he employed in late pieces such as "The Star-Spangled Banner" and "Machine Gun." Applying this type of sound to the entire band in live performance, as it is in the concluding section of "Bold as Love," would have been comparatively difficult. The effect can be heard clearly during the drum solo from 2:47-2:54 on the album release.

[110] A notable exception here, perhaps, is his 1967 single "Burning of the Midnight Lamp," which was recorded during the sessions that would furnish the material for *Axis: Bold as Love*. Although Hendrix's dramatic use of a wah-wah pedal can be heard in, for example, the live performance of the song released on *BBC Sessions*, the signature harpsichord part was nonetheless omitted. The song does not appear on any of Hendrix's other live albums, which (unlike the BBC recordings) were recorded during public concerts. This dichotomy between his singles (typically short and unaffected) and his more exploratory album cuts (typically long and highly affected) was no doubt a source of tension for Hendrix, who remained ambivalent throughout his life about the commercial impetus to play to his audience's expectations. As he remarked in a late interview with Bob Dawbarn, "I don't try to move an audience—it's up to them what they get from the music. If they have paid to see us then we are going to do our thing." See Bob Dawbarn, "Second Dimension: Jimi Hendrix in Action," in *The Pop, Rock, and Soul Reader*, third edition, ed. David Brackett, 242-244 (New York; Oxford: Oxford University Press, 2014).

contributions—his distinct drum sounds, for example—are readily accountable according to models of collaborative authorship in recording studios outlined by authors like Zak and Zagorski-Thomas, as well as those used by film scholars such as Sellors, Mayer's position is more ambiguous. Should he, like Kramer, be regarded as an author of some of the sounds heard on the Experience's recordings, especially the guitar sounds?

As someone without a credit on the Jimi Hendrix Experience's recordings, and thus without a "signature," it is difficult to say for certain how his role should be understood. In contemporary parlance, Mayer's role was closest to that of a guitar technician (or guitar "tech"), someone whose principal responsibility is to maintain the playing condition of a musician's instruments (including electrical equipment like pedals and amplifiers) between and during live performances. Such personnel, however, are rarely given credit for a performer or group's recorded output. The available evidence suggests that, although they might be developed to achieve a particular *sound*, the effect pedals that Mayer worked on were not developed for any specific *work*. (By contrast, consider how Hendrix highlights Kramer's contribution to a specific passage of music in the quote above, the concluding passage in "Bold as Love.") Indeed, although Mayer revised the Octavia pedal during his collaboration with Hendrix, the effect itself was invented prior to the two having come into contact. Similarly, his modifications to Hendrix's Fuzz-Face pedals were intended to provide consistent access to the best tones already available in that pedal's simple circuit and were not, therefore, created with the intention of producing work-specific timbres.

But if Mayer was not involved in a capacity that would demand acknowledging him as a coauthor of any specific works by the Experience, how are we to account for his nonetheless significant contribution? If the study of authorship is concerned with tracing the lines of agency

that come to furnish a work with its aesthetic features, then it needs to account both for the means (technology and technique) through which these features are produced, as well as the discursive processes through which some means come to matter more than others. Indeed, there is a crucial difference between employing commercially available technologies and utilizing custom-built devices, especially with regard to the different kinds of evaluative discourse that they suggest. While the former are available to anyone—thus prompting evaluation to focus on any novel results produced from of a common set of resources and limitations, a necessary precondition for assessing skill—the latter is unique and therefore would constitute a marked feature of any work in which it's employed. How can the manner in which Hendrix employs the Octavia on "Purple Haze" be evaluated if his audience neither knows what it is nor that it's there? Indeed, there is a potential to collapse the network of devices at Hendrix's disposal into (to return to the *BI* quotation at the beginning of this section) "just his guitar," a move easily supported by widespread acknowledgement of his musicianship during his life. As Michael Thomas put it for the *Eye*, "don't forget: musicians, who know, say he's the best guitarist in the world," a point readily corroborated by his high placement on *BI*'s best guitarist polls.[111]

3.4: (Dis)embodied Sound

But a demonstration of musicianship can only take place if there is a shared understanding between performer and audience regarding the mapping between physical action and sound production. A high degree of such correlation convinces the audience that the musician is responsible for the sound and, thus, is its author. This is a central tenet of what Philip Auslander

[111] Michael Thomas, "The Persecution & Assassination of Rock and Roll, as Performed by the Jimi Hendrix Experience… Under the Direction of Jumping Jimi Himself, the Cassius Clay of Pop," in *Hendrix on Hendrix: Interviews and Encounters with Jimi Hendrix*, ed. Steve Roby (Chicago: Chicago Review Press, 2012), 101.

terms a "traditionalist" view of musical causality, which privileges the visual: "what the audience sees should provide information about how the sound is being produced and perhaps about the musician's affective state."[112] But, even when a visual cue is absent, a causal relationship might still be communicable. As David Pattie has argued, "if a sound is created artificially, by triggering a preset"—in other words, in a situation where there is little correspondence between gesture and sound—"then that is acceptable if the sound itself is one composed by the musician."[113] That is, the contours of the sound itself must convey the sensibility of the musician, thus convincing the audience of its provenance. The anxieties circulating around the plethora of studio-based productions created in the 1960s, then, concerned the possibility that the sounds heard might not ultimately be those of the musicians to whom the recording is attributed because of the sharp distribution of labor wrought by both musical and technological specialization (engineer, producer, session musicians, etc.). One facet of Hendrix's achievement, then, was to so thoroughly integrate new electrical technologies into his musical aesthetic and performance style that they could no longer be interpreted as the contributions of anyone else.

Hendrix's ability to communicate a distinct, individual voice through new instrument technologies takes on additional significance when considered against the many negative critical evaluations of these same devices. For example, by virtue of its ability to radically transform the sound of a guitar (or any other electrical instrument, for that matter) with the simple flick of an on/off switch, fuzz had an especially polarizing effect amongst players, fans, and critics of popular music. Critics such as Lester Bangs have championed the democratic potential of such

[112] Philip Auslander, "Sound and Vision: The Audio/Visual Economy of Musical Performance," in *The Oxford Handbook of New Audiovisual Aesthetics*, ed. John Richardson, Claudia Gorbman, and Carol Vernallis (Oxford: Oxford University Press, 2013), 605. Such an emphasis on visual causality is genre-specific: while it might be highly relevant to evaluations of live events like classical recitals and rock performances, it may not be significant for fans of the dance-oriented popular music spectacles produced by artists such as Lady Gaga.
[113] Pattie, *Rock Music in Performance*, 36.

effects, which, in his telling, "put truly awesome sonic possibilities within the reach of the most limited musicians."[114] Far more common in the 1960s, however, was the negative corollary that impoverished technique yields impoverished ideas. The usage of such devices was then, in effect, over-compensatory. Mike Jahn's critique of fuzz, quoted in part earlier in this chapter, is exemplary of this position:

> Where a fuzz box, the strange collection of wires and transistors that extends guitar notes into long noodles of twisted sound, once was used as an embellishment to a good idea, it became a means of torture. Where electronic devices were once used to enhance, they became a *cause célèbre* of their own. It didn't take a poor guitarist long to learn that he could cover his lack of talent with layers of fuzz.[115]

Jahn was a particularly vociferous opponent of these technologies, noting in a March 1969 piece for *The New York Times*, "Much recent rock, notably psychedelic rock, has used such electronic effects as feedback and various tone distortions so much that any real musicianship is often swallowed in a raging electric sea."[116] Such skepticism regarding the level (and nature) of skill possessed by most popular musicians employing electrical equipment was perhaps best evinced by a question posed to John Sebastian of the Lovin' Spoonful in 1968: "isn't a dependence on electronic tomfoolery leading a lot of amateurs into thinking of themselves as serious artists?"[117]

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[114] Lester Bangs quoted in Jim DeRogatis, *Kaleidoscope Eyes: Psychedelic Rock from the '60s to the '90s* (New York: Citadel Press, 1996), 33. Ellen Willis, who wrote about rock music for *The New Yorker* throughout the late 1960s, corroborated Bangs' assessment without overtly aligning herself with its political implications. Reflecting on the rise of virtuosic guitar playing in rock, she writes: "Good musicianship was once as irrelevant to rock as it was rare; the whole point of electric guitars and dubbing and echo chambers was that kids with no special talent could make nice noises." See "Records: Rock, Etc.", *The New Yorker*, July 6, 1968, 56-57.
[115] Jahn, "Where Pop Music Is Now."
[116] Mike Jahn, "Californians Play Refreshing Rock at Fillmore East," *New York Times*, March 24, 1969, 52.
[117] Bob Michelin, "He Rocks Right onto Broadway," *Newsday*, October 8, 1968, 32A.

While musicians like Hendrix and Eric Clapton managed to avoid this kind of negative criticism, such effects—by virtue of their novelty and, oftentimes, sheer sonic force—routinely superseded the other craft- and technique-based features of music produced by musicians at early stages in their careers.

The commentary of Pattie, Appice, and Jahn (as well as the success of Hendrix himself) points to an emergent anxiety about disembodiment in the production of popular music. An embodied approach to understanding music assumes that the mental and physical processes of human beings are tightly interwoven, and that the movements of the human body are deeply implicated in any musical action.[118] Scholarly interest in embodied musical cognition has opened up a number of paths of inquiry.[119] But, for my purposes here, I am principally interested in the ways in which the perceptual correspondences between human action and sound production are implicated in the aesthetic debates of rock culture in the late 1960s. While recent discussions about music and embodiment have focused especially on the transformations in musicking enabled by digital technologies, the basis of these concerns was already present in the ambivalent discourses of the late 1960s around electronic instrument technologies.

Human beings can determine a lot of information about the properties of an object from the sounds produced in acting upon it.[120] Thus, no doubt because we have expectations for how

[118] See, for example, Marc Leman, *Embodied Music Cognition and Mediation Technology* (Cambridge, MA: The MIT Press, 2008); and Alexander Refsum Jensenius, "An Action–Sound Approach to Teaching Interactive Music," *Organized Sound* 18/2 (2013): 178-89.

[119] Two of the principal fields implicated in the study of embodied musical cognition are the study of interactivity in instrument design and music and information retrieval (MIR). See chapters six and seven in Leman, *Embodied Music Cognition and Mediation Technology*, respectively.

[120] See, for example, William W. Gaver, "What in the World Do We Hear? An Ecological Approach to Auditory Event Perception," *Ecological Psychology* 5/1 (1993): 1–29; S. Handel, "Timbre perception and auditory object identification," in *Hearing*, ed. B. Moore, 425-62 (San Diego, CA: Academic Press, 1995); Claudia Carello, Jeffrey B. Wagman, and M.T. Turvey, "Acoustic Specification of Object Properties," in *Moving Image Theory: Ecological Considerations*, ed. Joseph Anderson and Barbara Fisher Anderson, 79-104 (Carbondale, IL: Southern Illinois University Press, 2005); and Bruno L. Giordano and Steven McAdams, "Material identification of real impact sounds: effects of size variation in steel, glass, wood, and plexiglass plates," *Journal of the Acoustical Society of America* 119 (2006): 1171-81.

sounds correlate to particular objects and actions, we tend to expect to see these kinds of relationships corroborated by the actions observed in musical performance. Alexander Refsum Jensenius offers a useful schema for thinking through these relationships in his "action-sound" approach to musical causality, which he developed with the fourMs lab at the University of Oslo for teaching interactive music. He identifies five basic levels of action-sound separation: incorporated, direct, mechanical, analogue electronic, and digital electronic. The first three of these constitute what Jensenius terms "action-sound couplings" while the last two constitute "action-sound relationships"; crucially, "action–sound couplings are based on mechanical laws, while the action–sound relationships found in electronic instruments are designed and constructed electronically."[121] Because couplings are rooted in the same physical laws that structure and are observable in everyday life, these correspondences are quite strong. By contrast, the correspondences between sound and action in the case of electronic instruments are arbitrary, the result of choice. Jensenius demonstrates this with the example of a doorbell. While an electronic doorbell furnishing a "ding-dong" sound might demonstrate a strong action-sound relationship—correlating, as it does, with the particular action-sound coupling of the mechanical doorbells preceding it—a similar device whose function results in playback of a musical excerpt, while potentially rather pleasant, would demonstrate a comparatively weak relationship. Because of this, electronic instruments can easily challenge audiences' abilities to map sound to action in live performance and, indeed, this problem of mapping has oriented much electronic instrument design toward the creation of instruments with pronounced gestural components.

Jensenius' theorization of action-sound relationships can help us to better understand some of the challenges posed by new electrical instrument technologies to the aesthetic tenets of rock

[121] Jensenius, "An Action–Sound Approach to Teaching Interactive Music," 181.

culture, especially where notions of authenticity rooted in an "originary presence of actual voices, bodies, instruments, or performances" are concerned, to return to Paul Greene's lucid phrasing.[122] Because they are untethered from both the material world and prior performance practices, arbitrary action-sound relationships problematize an audience's ability to evaluate the skill of the performer, even in situations where the performer is not visible (such as when listening to a recording). Put another way, as Theodore Gracyk writes, an "audience's reception of art… requires an understanding of how *aesthetic qualities* and *meanings* emerge from the *materials*. We read works against a horizon of potentialities and limitations that artists explore in their materials."[123] That is, we make judgments about merit based on our knowledge of what the artist's materials afford. This kind of information is typically provided by some sort of musical paratext, such as album credits. Hypothetically speaking, if I understand that the instrumentation on a recording is comprised of guitar, drums, and bass, I can then evaluate the quality of the performances against my understanding of the affordances presented by those instruments, which I've developed over time from hearing other musicians working with the same materials. New electrical instrument technologies problematize this, however, by drastically altering the nature of an instrument and, thus, its affordances. While players like Jimi Hendrix, Eric Clapton, and Jeff Beck are credited as guitarists on their recordings, many of their most significant

[122] Greene, "Introduction," *Wired For Sound*, 10.

[123] Gracyk, *Rhythm and Noise*, 72. While this observation is certainly not specific to or limited to rock, it no doubt takes on additional significance with respect to rock culture's tendency to elide technical skill with artistic value. But David Yearsley, for example, presents a brilliant instance of this with regard to the semiotics of seventeenth-century organ pedal solos, where the profile of the line is meant to communicate the effort and skill required to execute the part with the feet only: "The facility of the hands is taken for granted; the struggle of the feet is a triumph over the body. Yet the semiotics of foot music are not just a response to the constraints of the physiological, but everywhere provide obvious and dramatic signals to the listener that his unseeing imagination is to be amazed at what these far-distant feet can do at their pedal-board high up in the church." See David Yearsley, "In Buxtehude's Footsteps," *Early Music* 35/3 (2007): 350. Relatedly, Robert Henke, in his work on digital instruments, has argued that musicians cannot practice and master an instrument that is constantly changing. While not available in a printed format, this idea was presented by Henke at a lecture given at McGill University's Schulich School of Music on March 24, 2016. See CIRMMTvideo, "Robert Henke - Give me limits!", YouTube video, 52:38, August 16, 2016, https://www.youtube.com/watch?v=iwOaYxSJGqI.

performances in the 1960s presented radical departures from the techniques and idioms then associated with the instrument. Indeed, of the many questions posed to Gary Hurst in his "Your Queries Answered" column for *BI*, the single most common inquiry ("roughly 30 per cent of all the letters I receive each week") concerned how to produce the distinctive guitar tone—characterized by its power, harmonic complexity, and sustain—pioneered by and associated with these very players.[124]

Clapton, himself, was asked in *Melody Maker* about the striking, high-sustain guitar sound that he employed on *Fresh Cream* (1966), which reader T. C. White described as his "violin tone." Clapton's response is worth quoting at length:

> I get the violin sound by putting everything full on and using finger vibrato. I worked for a long time to get it, because I always knew it was the sound I wanted. I can't exactly describe how it's done, because it is a freak effect—a lucky combination of guitar and amplifier—which I stumbled upon by accident. The principle of the violin sound is the sustain of a note, which can be done with a fuzz-box. So if you want to do it the easy way, buy a fuzz box! I've never used one, but I'm told the best on the market is the Wem-Rush Pep-box, made by Pepe Rush.[125]

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[124] Gary Hurst, "Your Queries Answered," *Beat Instrumental* 66, October 1968, 34. Hurst's repeated receipt of this inquiry highlights the novelty of this kind of sound processing at the time, as well as the lack of a visual referent for audiences to be able to imagine how that type of sound might be produced. Although the nature of sound-action relationships is arbitrary, the strength of such relationships might also change over time. Indeed, Jensenius discusses this with specific regard to the electronic effects employed by instrumentalists: "In some cases, such action–sound palette extensions will become part of the standard action–sound repertoire, such as the use of distortion and wah-wah pedals with electric guitars. Even though such effects originally represented drastic changes to the sonic result of a guitar, there are few people who would find such guitar effects perceptually challenging today." See Jensenius, "An Action–Sound Approach to Teaching Interactive Music," 182.

[125] "A freak effect—a lucky combination of guitar and amp," *Melody Maker*, March 4, 1967, 16.

The relationship that Clapton posits here between the agency of his equipment ("guitar and amplifier") and his own instrumental technique is striking. On the one hand, Clapton acknowledges that this unique sound is a "freak effect," which he "stumbled upon by accident."[126] While this conclusion might seem to both contradict his previous assertion ("I always knew it was the sound I wanted") and to diminish his own agency both in producing it—articulating the violin tone as something "instantly" produced by his equipment, and thus doable by anyone with the same—Clapton is careful to highlight the role that his own manual dexterity plays in producing his unique sound ("using finger vibrato") as well as the time he has invested in developing his technique. Indeed, even if this sound could not be produced without the feedback loop between Clapton's guitar and amplifier (augmented by "putting everything full on"), the movements of his fingers create a physical mapping between gesture and sound that demonstrates Clapton's control. Here, then, we can see Clapton recognizing his instrument's status as a genuine *actor*, in the sense that actor-network theory employs this term, and attempting to re-assert his own agency to temper the very real aesthetic ramifications of this theoretical insight within his musical milieu.[127] Clapton also acknowledges that a similar sound can be produced via a fuzz effect, though it is not clear from this passage whether or not Clapton believes there to be a significant difference in the quality of the effect depending upon the means by which it is produced. Significantly, though, the fuzz box constitutes the "easy way" to

[126] In other sources, Clapton has discussed the ubiquity of feedback in his performances, where underpowered amplifiers were driven beyond their capacity on a regular basis. Learning to "control" this feedback became a staple of his playing, as well as that of other prominent mid-1960s British session guitarists like Jeff Beck and Jimmy Page. In an interview with *Guitar Player* magazine, Clapton explained that upgrading to a more powerful amplifier—capable of projecting the signal from his guitar without unintentional distortion—diminished his ability to play with the sustain afforded by feedback, which he sorely missed. See Steve Rosen, "Emotion Rules Everything I Do," in *Clapton, Page, Beck*, ed. Michael Molenda (Milwaukee, WI: Backbeat Books, 2010), 99.

[127] For a short primer on the nature of actors in actor-network theory, see Bruno Latour, *Reassembling the Social* (Oxford: Oxford University Press, 2005), especially chapter three, "Third Source of Uncertainty," and its subsection "Making objects participants in the course of action," 70-74.

produce the effect, which Clapton does not use. Thus, while Clapton's response refers to a body of new electric guitar timbres and techniques that would have been unrecognizable according to past standards of musicianship, he is able to articulate different approaches to pursuing a single sound that speak directly to difference in ability. Such discourse, then, performs a crucial role in articulating new standards of musicianship by which rock musicians can be judged from within their own field of practice.

A similar discursive trend is observable amongst a segment of rock musicians that were wary of the expanding use of synthesizers in the 1970s. Because of the programmability and versatility of synthesizers, many technically skilled guitar players actively distanced themselves from these instruments so that audiences could appropriately judge their skill knowing that, in the case of a Queen record, for example, there were "no synthesizers" used. The assumption, then, is that it is more difficult to create a variety of sounds on a less technologically sophisticated instrument and, therefore, it is more spectacular and praise-worthy when a player is able to do so. But the development of the synthesizer, and its transition from the electronic avant-garde studios of the 1950s to the rock stages of the early 1970s, presents an interesting paradox with regard to rock's aesthetic preoccupation with individuality and its practical preoccupation with live reproducibility. On the one hand, as we have seen, certain musicians and fans placed high value on being able to reproduce their recorded music live on stage. While the complexity of instruments produced by designers such as Robert Moog presented musicians with ample opportunity to express their personal proclivities and vision, such devices were thoroughly impractical for touring. Indeed, as I discuss in more detail in the following chapter, in an era before storable presets the prospect of reproducing exactly a work-specific sound through a network of patch-cords was daunting and impractical. The 1970 release of the Minimoog, a

monophonic synthesizer whose options for signal routing were hard-wired in lieu of cabling, thus presented musicians with a practical means to incorporate these novel timbres into live performances. But, as Trevor Pinch has observed, "By rejecting the patch wire approach of earlier synthesizers, the Minimoog in effect hardwired in certain sorts of sound. Sound was becoming more controllable and reproducible and at the same time more standardized."[128]

Unsurprisingly, this move toward reproducibility and standardization prompted anxieties within the rock milieu, with its signal approbation of individual agency and expression. As Simon Frith explains:

> The argument that recurred in the pop press in the 1970s was that the production of electronic noises by synthesizers left no room for individual "feel" or "touch." Gary Numan could tell readers of *Melody Maker*'s musicians' advice page exactly how to reproduce his sound in a way that Jeff Beck or even Keith Emerson could not. They could describe their techniques but not their final, on-the-spot judgement. All Numan had to do was write down the position of his various switches.[129]

But in addition to their techniques these musicians also described their equipment. Indeed, while it is striking that Numan is able to detail the exact position of the switches and knobs used to determine his instrument's timbre—a phenomenon which would expand through the production of synthesizer presets—this is not altogether dissimilar from a guitarist with a lightly-strung Gibson Les Paul and the appropriate make and model of amplifier following Eric Clapton's own

[128] Trevor Pinch, "Technology and Institutions: Living in a Material World," *Theory and Society* 37/5 (2008): 477.
[129] Frith, "Art versus technology," 265.

instructions to put "everything full on and [use] finger vibrato."[130] If synthesizers were understood as somehow "soul-less" by virtue of the ease of disseminating standardized sounds in the 1970s, it's worth considering the parallels to be found amongst the anxieties experienced in the rock milieu concerning electric guitars. What both of these episodes in the history of popular music point to is a growing concern with how a performer's body should be able to determine the features of a sound, and in what generic contexts a demonstration of these correlations is necessary. Furthermore, these episodes also require thinking about the extent to which different genres of popular music prioritize timbre, pitch, rhythm, or any other musical parameter over the others. As we've seen, many critics were quick to dismiss the efforts of amateur musicians with regard to electronic instrument technologies like fuzz and wah-wah pedals. "Great" players, however, were defended from such criticisms, typically on the grounds that their timbral explorations were ancillary to the "music itself." The threat posed by these new technologies, were they to become an end in themselves, is thus at least in part an ontological one: what is the material of music? What is it "about"?

It doesn't seem unreasonable to say that a song like Numan's "Cars"—comprised, as it is, of a selection of short, somewhat banal melodic phrases that function principally as vehicles for interesting timbres—is less "about" pitch than even Cream's "Tales of Brave Ulysses," a veritable showpiece for the timbral possibilities inherent in the then-new wah-wah pedal. It is not

[130] I am referring here to an exchange published in the letters section of *BI* between T. R. Dixon of St. Annes-On-Sea and the magazine's editor. Following an "Instrumental Corner" feature discussing how to recreate Clapton's famous guitar sound, Dixon wrote: "I am sorry to see that the writer of 'Instrumental Corner' is under the impression that all we guitarists have to do is to go out and buy ourselves a Gibson Les Paul in order to emulate Eric Clapton 'without much extra effort'. What an insult to Britain's greatest blues guitarist!… Did Clapton get to where he is without effort? I too work a lot at the guitar, but I am not quite in the Clapton class!" To which the editor responded: "The 'Instrumental Corner' to which you refer stated that it was easy to get the SOUND of such greats as Clapton, given the same gear. We made no reference to the subject of proficiency on any instrument." See "Your Letters," *Beat Instrumental* 51, July 1967, 37. For a history of the unexpected rise of pre-written synthesizer patches ("presets"), see chapter four in Paul Théberge, *Any Sound You Can Imagine: Making Music/Consuming Technology* (Hanover; London: University Press of New England, 1997).

the incessant oscillation between A and G that gives "Cars" its interest but rather the ethereal, electronic sounds that drift over this harmonic movement. This focus on sound over pitch is disconcerting precisely because the interesting timbres in "Cars" can be recreated by anyone with the same or comparable equipment, thus challenging traditional notions of musical technique. And although the wah-wah effect in "Tales of Brave Ulysses" certainly adds timbral interest to the verse's guitar ostinato, Clapton's most attention-grabbing gestures are the fills and solos that he intersperses throughout the track. Whereas the pitch and rhythmic structure of the various riffs present in "Cars" repeat verbatim over the course of the song, these improvised moments in "Tales of Brave Ulysses" are highly active in the domain of pitch, featuring little repetition from section to section. Thus, despite Clapton's novel work with the wah-wah pedal, his performance is still dominated by the expressive blues-based guitar phrasing typical of the period and his own performance style. This contrast between the focus on timbre and pitch in both songs is perhaps most clearly illustrated during the instrumental outro of "Cars," where a new counter-melody is finally added against the song's distinctive synthesizer tune. Generally inactive in the domain of pitch (the first four measures of the six-measure phrase feature a single, tied note in both parts: A and C-sharp, respectively), the listener is occupied principally with the undulating modulations proffered by holding down a single key on a synthesizer programmed with the right settings. The two-measure, descending G-major arpeggio that follows is merely a brief palette cleanser, re-establishing the interest of the single, held note as we return again and again, ad infinitum as the song fades out.

From electronic dance music to rock 'n' roll to the symphonies of Gustav Mahler and, no doubt, many other examples, there is a long history of establishment figures denigrating the

efforts of musicians engaged with timbre at the expense of pitch relationships.[131] As Jim Graham of Falkirk lamented in a 1970 letter to *BI*:

> I have for some time now watched the steady degeneration of this country's pop music industry. The word "quality" no longer has a place in the vocabulary of the industry.… We have a host of ear players who combine high-power low quality amplification with one or more electronic effects (fuzz, wah wah, etc.) and as many unintelligible semi-quaver runs in as few bars as possible.… Colleagues, you absolutely disgust me.[132]

Since the emergence of sound recording as the principal object of the popular music marketplace, it is hard to imagine a time when all players were not, to some extent, "ear players." By stressing the importance of sound—that is, timbre—as a source of popular music's value, critics have instilled the sounds heard on popular music recordings with a degree of cite-ability that has only expanded over the past few decades, especially through the techniques of

[131] This point is made well by Simon Reynolds with regard to electronic dance music in his "Historia Electronica Preface": "For conventionally trained musicians, the chord progressions and harmonic intervals used in electronic music can seem obvious and trite. But this misses the point, for the real function of the simple vamps and melody-lines is as a device to display timbre, texture, tone-colour, chromatics." See Simon Reynolds, "Historia Electronica Preface," in *The Pop, Rock, and Soul Reader*, third edition, ed. David Brackett (Oxford; New York: Oxford University Press, 2014), 505. For examination of the critical reception of Mahler's symphonic works in the early twentieth century, especially with regard to fears about the physicality of timbre, see Karen Painter, "The Sensuality of Timbre: Responses to Mahler and Modernity at the 'Fin de siècle'," *19th-Century Music* 18/3 (Spring 1995): 236-56. Painter's work highlights critics' prioritization of pitch-based structures over timbre in orchestral music of this period, with details of instrumentation being deemed incidental to thematic organization and development. The pitch-centeredness of Western concert music can also be seen in the epigraph with which I began chapter one, an amusing exchange observed between a "serious" music fan and a pair of rock 'n' roll musicians: "Two of today's popular rock 'n roll guitarists were told rather indignantly by a serious music lover: 'You shouldn't be allowed to call yourselves musicians.' The rock 'n roll guitarists adjusted the output controls on their amplifiers, so they could be heard, and replied: 'Lady, nobody said we were musicians... just call us electricians.'" See "Current Pops," *Picturegoer*, January 2, 1960, 12.

[132] "Letters," *Beat Instrumental and International Recording Studio* 84, April 1970, 62.

sampling.[133] But while "sound" was an important source of rock's earliest accreditory discourses, by the end of the decade many of its players were being venerated according to the standards of other musical traditions, especially jazz and classical. For critics like Graham, the banalization of pitch content ("unintelligible semi-quaver runs") and consequent glorification of timbre has led to the "death" of a term favored by these high-cultural fields: "interpretation."[134] The anxieties expressed in the 1970s popular music press about "soul-less" synthesizer music, then, were presaged in the 1960s when fans and critics expressed concern that a burgeoning focus on timbre might subsume the other features of a skilled performer's style: the dexterity of their body, the expressivity of their phrasing, the spontaneity of their improvisations, and so on. The perceived "coldness" of synthesizers in the 1970s, attributed to the way in which micro-decisions—those aspects we often refer to as "feel" and "touch"—seem to be outsourced from the performer's body to a machine, can be productively read as the next step in a process of further distributing sound-shaping capacities throughout a network (or assemblage) of components.[135]

3.5: Conclusion: What is a (Rock) Author?

The singular article in the heading above, as well as that of the title of the Foucault essay from which it is derived, points to the corresponding endurance of singularity in thinking about (rock) authorship. Even though the production of popular music, like film, is a fundamentally

[133] A classic sound like the "hoover," for example, originally made available as a preset on the Roland Alpha Juno and closely associated with early 1990s rave culture, can now be cited by someone like Lady Gaga, who featured the sound on her 2009 hit "Bad Romance."
[134] "Letters," *Beat Instrumental and International Recording Studio* 84, April 1970, 62.
[135] In the days before aftertouch and other keyboard expressivity controls, the limited gestural control offered by early portable synthesizers would have contrasted starkly with the interface provided by the electric guitar. Nonetheless, it should be noted that the original Moog Model-D, commercially available in 1971, featured two gestural controllers, the mod and pitch wheels, which have been a common feature of portable synthesizers ever since.

collaborative enterprise, the rock utterance demands to be heard as the expression of an individual as it enters into a world governed by an ideology heavily indebted to Romanticism. While the potentialities and affordances from which works are shaped—proffered by whatever agent(s), whether human or non-human—inevitably imbue these very works with certain of their features, for rock audiences these potentialities are ideally subsumed by one: the auteur.

In this chapter, I have sought to show that authorship is both a status and a fact. That is, following Foucault and Derrida, authorship is something that is ascribed to an individual and can be mobilized as an explanatory mechanism, a kind of interpretive key. But, simultaneously, authorship is also the result of a series of interactions between materials and actors (which might also be materials). If "building," "fixing," and "designing" are not the actions that furnish authorship in 1960s rock—though they may very well do the same in a field such as 21st-century sound art—they nonetheless remain actions upon which the authorial acts of rock ("playing," "writing") depend. Indeed, it should be noted that the contributions of sound engineers like Eddie Kramer and electrical engineers like Roger Mayer that I've highlighted in this chapter present rather overt instances of individuals beyond the recognized author of a popular music work furnishing said work with its significant aesthetic features. But it is also true that the input of such personnel can shape recordings in much more subtle ways, whether it concerns the positioning of musicians and instruments in a room, the choice of microphones, the application of dynamics processing, and countless other technical—that is, musical—decisions that need to be made along the way.

Both conceptions of authorship are productive avenues of inquiry. Because recognition as an author by others (author-as-status) is a prestigious position in many fields of cultural production, examining how this distinction is bestowed reveals the systems of evaluation

governing a field of cultural practice. We might well ask under what circumstances audiences want or need music to be "honest," and trace the attendant anxieties that emerge around technological change. How can technology be used to make music seem more real in a given historical, cultural, and generic context? More fake? How do new technologies prioritize certain musical parameters over others? How do they foster new interactions with performers' bodies, and how do these challenge audiences' abilities to believe what they see and hear? Similarly, examining the full range of actors contributing to the production of a work (author-as-fact) can highlight agents that have been traditionally neglected by histories of cultural production including, of course, studies of popular music. To return to a central example of this chapter: if Hendrix is widely celebrated for his embrace of new electrical technologies and his ability to harness their affordances toward his own creative ends, we should also have great interest in the agents who furnished him with these possibilities. The goal here is not to diminish any sense of reverence for Hendrix's musical achievements with the instrument technologies that he employed. Rather, we should aspire to elucidate both the contributions of James Marshall Hendrix, the individual, as well as the multitude of other agents enabling—and whose traces can still be found on—"Jimi Hendrix," the "genius."

Chapter 4 | High Tech/Low Tech: The synthesizer and "electronic music" in rock discourse

"Knowledge of how to compose electronic music can be obtained only by special training courses available at Universities and schools of music."[1]

— F. C. Judd

"The kids, however, had been vibrating to electronic sounds for years. All those guitars and organs were strictly turned on, and feedback, sound-on-sound and multiple tracking were familiar terms to the rock generation. They had little trouble picking up on Moog sounds."[2]

— Bob Micklin

For a decade whose popular music styles were so inextricably bound up with the development and exploitation of new, electronic technologies, it is fitting that the *cause célèbre* at the decade's end was none other than the electronic instrument par excellence: the synthesizer. Of especial import were the instruments developed by Robert Moog; for many the Moog—which, for a period of time, functioned as a generic term for synthesizers of all makes—represented not only the influx of a huge body of new sounds into musical practice, but also an entirely different approach to working with sound: of crafting sounds from scratch. But, as Bob

[1] F. C. Judd, *Electronics in Music* (London: Neville Spearman, 1972), 113.
[2] Bob Micklin, "New Discs Unworthy of Music a la Moog," *Newsday*, September 15, 1969, 32A.

Micklin's epigraph above highlights, for fans of popular music (especially rock) in the late 1960s, the new possibilities presented by the Moog were thoroughly in line with the open, exploratory sonic trajectory that rock musicians had already embarked upon well in advance of the synthesizer's arrival in mainstream culture. For critics like Micklin and James Michener, whose mid-decade writings I quoted extensively in chapter one, the initial shock of rock bands' electrified instrumentarium was predicated on the sheer volume of their performances. But by the end of the decade, the "electronic-ness" of these sounds was being re-situated in their distance from the "natural" sounds of everyday life and "known" instruments.

While the sound of the synthesizer had to wait to find its greatest rock advocates until the 1970s, in the hands of virtuosic keyboard players like Keith Emerson and Rick Wakeman, its sudden irruption into the public imagination in the wake of psychedelia and Wendy Carlos' *Switched-On Bach* (1968) prompted consideration of the rarefied electronic compositions of the classical avant-garde alongside recent works by rock musicians, a tentative alliance drawn together under the banner of "electronic music." But, as Fred Judd points out in the other epigraph here, the term "electronic music" has often been viewed as the exclusive purview of "serious" composers, and efforts to bridge the gap between the pop and classical fields were not without their critics. The synthesizer, an instrument that ultimately found adherents among a diverse group of musicians, played a special role in this history by temporarily reframing the scope of what was possible with a musical instrument before finally becoming a standard tool in the practice of popular musicians.

Although this chapter is not a history of the synthesizer, it presents an examination of some of the synthesizer's most significant effects on rock culture. I begin by constructing a rough genealogy of the term "electronic music" in order to better understand the grounds upon which

rock and the classical avant-garde were drawn together into a commercial alliance. Although the term has often been used to refer to very specific musical styles and practices, definitions of electronic music tend, nonetheless, to remain rather broad. Thus, I ask a historiographical question: what is the subject of a history of electronic music, and how has this shaped our understanding of which technologies are truly "electronic"? From here I turn to a pair of rock groups that constructed their own electronic instruments—San Francisco's Fifty Foot Hose and New York City's Silver Apples—and examine the ways in which the popularization of the synthesizer impacted the terms of these groups' reception. The synthesizer, I argue, shifted the technological frame of rock culture by virtue of its complexity to include a distinction between high-tech and low-tech instruments. As a result, critics came to find merit in the way that the music of these groups exceeded the perceived limitations of the equipment with which it was made. I conclude by considering what may well be the "lowest-tech" instrument featured in rock in the 1960s: the 13th Floor Elevators' "electric" jug. While the instrument and its eerie sound were regarded ambivalently during the group's short tenure, the jug has subsequently been rehabilitated as a kind of "proto-synthesizer" by contemporary critics and now stands as the group's most defining feature.

4.1: "Electronic Music" or "Electronics in Music"?

"Mus. prod. by elec. means, the resulting sounds being recorded on tape."[3]

— The Oxford Dictionary of Music

At its most broad, the term "electronic music" refers to any music that has been produced and/or consumed with the aid of electronic technologies. The term first came into usage to describe music written featuring one of the many new electronic instruments being developed throughout the 1920s and 1930s—including the theremin, the Ondes Martenot, the Trautonium, etc.—then later coalesced in the 1950s around a particular type of avant-garde music composed in a body of new electronic music studios, many of which developed as an outgrowth of state-funded radio stations.[4] As these composers shifted their practice to the studio, they were able to produce works without needing a separate performer or group of performers to interpret their compositions. The emergence of "electronic music" in the 1950s thus marked a significant departure from earlier compositional practices within the domain of Western art music, while simultaneously establishing continuity with the increasing focus on specificity and control exhibited by the procedures of serial composition. As musicians and critics sought to distinguish between different approaches to electronic music composition, an aesthetic (and nationalist) dichotomy emerged between *musique concrète* and *elektronische Musik* on the basis of the composer's chosen source materials. *Musique concrète*, closely associated with the work of Pierre Schaeffer and his French colleagues, is predicated on the manipulation of recorded sounds

[3] "Electronic Music," *The Oxford Dictionary of Music*, second edition (rev.), Oxford Music Online, Oxford University Press, accessed June 20, 2017, http://www.oxfordmusiconline.com.proxy3.library.mcgill.ca/subscriber/article/opr/t237/e3341.

[4] In many histories of electronic music, the year 1948, when Pierre Schaeffer began his work with *musique concrète* at the Radiodiffusion Française, is positioned as the genre's origin.

of any type, while *elektronische Musik*, closely associated with Karlheinz Stockhausen and his German colleagues at the WDR studio in Cologne, is restricted to electronically generated sounds. As this strict dichotomy has gradually fallen out of favor, the term "electronic music"—often used interchangeably with "electro-acoustic music"—now encapsulates both groups. Ostensibly this is the gist of the *Oxford Dictionary of Music*'s definition in the epigraph above, though the association with a particular technological paradigm (tape) ties it to the music of the immediate postwar period.

One way of interrogating the boundaries of a broad category like electronic music is to examine the subjects of histories written on the topic. Like the *Oxford Dictionary of Music*, Barry Schrader's *Introduction to Electro-Acoustic Music* (1982) acknowledges the broad scope of what might fall under the banner of "electro-acoustic music," which "refers to any music that is produced, changed, or reproduced by electronic means.… The definition of electro-acoustic music is so broad that it serves only to distinguish such music from *acoustic music*."[5] But the narrowed remit of Schrader's history belies the inclusivity suggested by his understanding of the term; beginning with the *musique concrète* of Pierre Schaeffer and moving forward through time according to the development of new technologies and techniques, Schrader's history omits any intersection with contemporaneous developments in other musical fields, including rock, pop, and jazz. Indeed, despite Schrader's focus on the elevated importance of timbre in electro-acoustic music, he is nonetheless dismissive of work that he perceives to be unoriginal in the domain of pitch (paralleling the theme-based analyses of much Western concert repertoire, many of Schrader's compositional analyses divide works according to their use of "timbral themes"). This bias is most clear in his discussion of the work of Wendy Carlos. Although Schrader

[5] Barry Schrader, *Introduction to Electro-Acoustic Music* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1982), 1.

acknowledges the influence of Carlos and her commercial success, he positions the bulk of her work in "the field of transcription, rather than original composition," and thus beyond the consideration of his study.[6] There is a tacit suggestion here, then, that there is more to distinguish electronic music from acoustic music than means alone.

For their part, popular musicians had been exploring the affordances of electronic technologies in parallel, though they sometimes mobilized them for very different ends. For example, while Schaeffer was exploring a range of techniques by which tape recorders could be used to manipulate pre-recorded material in order to produce original compositions, Bing Crosby was using them to pre-record radio broadcasts so that he could be "on air" without physically being present in the studio.[7] But many times, too, popular musicians and avant-garde composers were interested in developing a similar repertoire of techniques, even if their ultimate aesthetic goals were different. While Otto Luening was slowing down flute recordings to create the eerie soundscapes in *Low Speed* (1952), Les Paul was speeding up guitar recordings to create the ebullient licks in "Lover" (1948). While Tod Dockstader was transforming the sounds of laughter with tape delay in *Luna Park* (1961), Elvis Presley—with the help of Sam Philips—was making tape delay an integral part of the sound of rockabilly on songs like "Blue Moon of Kentucky" (1954). Even the novel sound of "purely" electronic instruments found some success in the field of popular music, including Les Baxter's *Music Out of the Moon* (1947), which featured theremin; Del Shannon's "Runaway" (1961), which featured keyboardist Max Crook's homemade Musitron; and the Tornados' "Telstar" (1962), which included clavioline.

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[6] Schrader, *Introduction to Electro-Acoustic Music*, 136.

[7] For more on Crosby's use of magnetic recording after World War II and the debate about "canned music" on radio in the United States, see David Morton, *Off the Record: The Technology and Culture of Sound Recording in America* (New Brunswick, NJ; London: Rutgers University Press, 2000), especially chapter two.

Yet it was not until the middle of the 1960s, when popular musicians like the Beatles and Jimi Hendrix engaged the sonic and procedural tools of the recording studio, that the term "electronic music" came to be applied to the work of popular musicians. Central to this shift, of course, was rock's upward movement in the cultural hierarchy, a shift that scholars such as Bernard Gendron and David Brackett—whose work I discuss in greater detail in chapter three—have attributed first and foremost to folk music and the related hybrid genre of folk-rock.[8] As rock musicians were treated as proper artists they also began to incorporate influences from high-status musical genres, including the classical avant-garde, which only served to further corroborate their newfound legitimacy. And although more marginal avant-rockers such as Frank Zappa were producing innovative work at the same time as the Fab Four, the gateway between popular music and the classical avant-garde was flung wide open by the Beatles, whose recordings from 1966 and '67 not only showcased a variety of studio manipulations that were then uncommon in the pop field but were also hugely successful commercially.[9] The otherworldly, collage-like textures of songs like "Tomorrow Never Knows" and "Being For the Benefit of Mr. Kite" were far closer to the aesthetics of *musique concrète* than any other mainstream popular musician beforehand. Furthermore, during this period the Beatles, especially

[8] See Bernard Gendron, *Between Montmarte and the Mudd Club: Popular Music and the Avant-Garde* (Chicago; London: Chicago University Press, 2002), especially chapters eight and nine; and David Brackett, "Rock," in *The Continuum Encyclopedia of Popular Music of the World*, vol. 10, ed. John Shepherd (London; New York: Continuum, 2003), especially 17-27.

[9] The Beatles' own role in ushering in an age of artistic pop music was recognized immediately by contemporary critics. Richard Goldstein, for example, wrote that *Revolver*, an album whose principal accomplishment was opening up pop to electronic music, would be recognized in hindsight "as a key work in the development of rock 'n' roll as an artistic pursuit." See Richard Goldstein, "Pop Eye: On 'Revolver,'" in *The Pop, Rock, and Soul Reader*, third edition, ed. David Brackett (New York; Oxford: Oxford University Press, 2014), 216. Furthermore, the Beatles' movement into the domain of art was also supported by critics who connected the harmonic and melodic aspects of their songwriting to the work of composers firmly established in the Western canon, such as Franz Schubert and Gustav Mahler. William Mann's early piece for the London *Times* is an important historical document in this regard, as is Wilfrid Mellers' early Beatles monograph, *Twilight of the Gods*. See William Mann, "What Song the Beatles Sang…", *The Times* (London), December 23, 1963; and Wilfrid Mellers, *Twilight of the Gods: The Music of the Beatles* (New York: Viking, 1973).

McCartney, publicly professed their admiration of contemporary composers, including Stockhausen—who was to be immortalized on the cover of *Sgt. Pepper*—and Luciano Berio.[10]

In the closing scene of the AMC drama *Madmen*'s "Lady Lazarus" (season 5, episode 8), Don Draper unsheathes a copy of *Revolver*, places it on his turntable, and skips straight to "Tomorrow Never Knows." He sits and listens for about a minute and a half—as other elements of the plot develop beyond the confines of his apartment—before abruptly removing the needle and walking out of the room. In an episode whose plot hinges upon the forty-year-old Draper's distance from youth culture, especially music, it's not difficult to read the final scene as being symbolic of that gap. For critics not accustomed to the vocabulary of avant-garde electronic music, nor captivated by the sheer novelty of its incorporation in rock, the result was boredom. As one record executive told *Beat Instrumental* (*BI*) in response to the Jimi Hendrix Experience's debut record: "Electronic music will not be prominent in future records as it does become wearing after a time. This applies to a degree on the Jimi Hendrix album, though I'm not knocking him. Just that the album did become a bit boring for me after a while."[11] Indeed, this trope of intertwined unintelligibility and sameness was a hallmark of the difficulties encountered by electronic music presented in the concert hall as well.[12]

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[10] Maureen Cleave, "Old Beatles—A Study in Paradox," *New York Times*, July 3, 1966, 118.
[11] "Britain's Top A&R Men," *Beat Instrumental* 52, August 1967, 21.
[12] One interesting point of comparison between the fields of popular and classical electronic music is the nature of the negative critiques they received in the mainstream press. As a vanguard subset of musical practice, both groups of musicians were exploring the expressive potential of new technologies. And, during this period of intense novelty, both were subject to similar charges of sameness and boredom, a failure to live up to the promise of the technology. Harold Schonberg's review of the electronic music ("one of the very latest fads") showcased at the Second Annual New York Festival of the Avant-Garde for the New York Times is exemplary: "Part of the boredom was due to the fact that the various composers, employing the most up-to-date of media, simply had little talent. They have heard various electronic music examples from studios in New York, Cologne and Utrecht, and they go around copying the sounds and adding little of their own.… How many times can one hear a frequency sweep, or an elementary electronic manipulation of something corresponding to a tone tow? And the tonal language of what could be one of the most exciting of postwar musical phenomena has been compressed into a few standard gulps, blobs and fizzles." Harold C. Schoenberg, "Music: In Electronic Vein," *New York Times*, September 1, 1964, 30.

Another factor guiding the application of the term "electronic music" to the work of popular musicians was an increased interest in the effects of new technologies on humans and society. For many, in a discursive environment strongly shaped by the then-fashionable media theories of Marshall McLuhan, the novel electronic technologies and techniques employed—and occasionally shared—by both rock musicians and the classical avant-garde was enough to unite them in a common project.[13] Electronic means were, themselves, the "message," though the challenge presented by songs like "Tomorrow Never Knows" surely exacerbated the music's perceived difference from the familiar world that electronic technologies were poised to irrevocably change. As David Ahlstrom noted in a 1968 piece from the *Music Journal*, in an era characterized not only by an increase in electronic instruments but also an increase in the application of electronic technologies in the transmission of music, this broad definition very quickly comes to encompass nearly everything:

> Today electronic music is not only music on tape, but that performed live as well, and in some cases by people who do not think of what they do as electronic music. And, in a way, all recorded music or music played on radio, television, and film sound tracks can be regarded as electronic music, and indeed must be, if we are to be fully aware of the real revolution taking place.[14]

[13] The media theories of Marshall McLuhan were also influential within the emergent field of rock criticism. Richard Goldstein, for example, employed McLuhan's distinction between "hot" and "cool" media in order to explicate that which separated the aesthetics of rock from previous genres of music. See Richard Goldstein, "Pop Eye: Evaluating Media," in *The Pop, Rock, and Soul Reader*, third edition, ed. David Brackett, 250-253 (New York; Oxford: Oxford University Press, 2014).

[14] David Ahlstrom, "The Electrocution of Rock," *Music Journal* 26/8 (October 1968): 22.

The scope of Ahlstrom's definition contrasts markedly with an early essay on electronic music published in *The North American Review* in 1932. In it, Raymond Francis Yates draws a clear distinction between music produced with electronic instruments and music consumed via electronic means: "Electrically produced music, or, more correctly, electronic music, is not to be confused with ordinary electrically reproduced music coming from radios, talkies or electric phonographs."[15] But in the years separating the publication of both articles, electronics had radically redefined the contours of human life, especially through their application in the technologies of mass communication and war. Indeed, though both decades had access to electronic technologies, the 1960s stood as an "electronic age" in a way that the 1930s could not. As such, the electronic-ness of electronic music in the 1960s was perceived to be a marker of its contemporaneity. And, indeed, efforts to achieve greater specificity in identifying what kinds of music comprise the field of electronic music are further problematized by the way in which terms like electric, electrical, and electronic were used alongside other amorphous, contemporary colloquialisms like "psychedelic" to ascribe positive value by dint of novelty or freshness—in other words, to be "hip" or "cool."

To summarize so far, although the affordances of electronic sound technologies were explored and exploited in the postwar period simultaneously by both avant-garde composers and popular musicians, their practices were not drawn together under the common banner of "electronic music" until (1) popular musicians began to broach the rarefied idioms of the avant-garde and (2) cultural critics began to consider electronics as paradigmatic of the present. But despite their historical and aesthetic differences, both fields benefited from their provisional association. If cutting edge studio practices afforded rock a measure of symbolic capital, surely

[15] Raymond Francis Yates, "These Musical Electrons," *The North American Review*, March 1, 1932, 263.

classical labels like Nonesuch and Columbia Masterworks noticed the surge in sales, especially of their more vanguard repertory, boosted by the efforts and endorsements of popular musicians (such as McCartney) who were interested in exploring techniques and technologies developed in academic studios. Indeed, as Jac Holzman of Nonesuch and Elektra was quick to note at the end of 1967, the year that saw the release of both Morton Subotnick's *Silver Apples of the Moon* and *Sgt. Pepper's Lonely Hearts Club Band*, "We would have had no success with 'Silver Apples' without the Beatles."[16]

For critics seeking to make sense of this new phenomenon, the name often ascribed to this loose alliance was "electronic music." In a piece from 1969, *Newsday*'s Ron Eyer exemplifies how the term might be used to mark out this music's difference from the ordinary and the taste of the masses:

> If someone mentions a Theremin and you think he's talking about a multi-vitamin capsule; or if the name Stockhausen conjures up visions of a Teutonic corral; and if you assume that "white noise" is the title of a new rock band that refuses to play rhythm and blues, well, that's perfectly understandable. You're not alone. You are, in fact, in the vast majority of people whose awareness of electronic music extends about as far as the Beatles and their "Sgt. Pepper's Lonely Hearts Club Band."[17]

Each of Eyer's analogies are marked by their difference from his readership's daily, lived experience. In one reading, Eyer's analysis positions "electronic music" as the vanguard of both

[16] Theodore Strongin, "Contemporary Classical Disks Rising," *New York Times*, December 20, 1967, 49.
[17] Ron Eyer, "That New Sound Is Here to Stay," *Newsday*, February 18, 1969, 32A.

popular and classical musics, which remain separate fields; if Stockhausen represents the cutting edge of the classical world, so too does White Noise represent the cutting edge of rock by rejecting the standard practices of that field (i.e. playing R&B). In another reading, Eyer positions both popular and classical music on a single spectrum according to the complexity of the music; both Stockhausen and the Beatles produce "electronic music," but the Beatles' is far easier for the lay person to comprehend. The Beatles, then, might function as a kind of introductory course, a gateway for uninitiated listeners to work their way up to the more demanding works of composers like Stockhausen, Babbitt, and Cage.

Thus, one of the major effects of these critical linkages was the production of a larger—and, as we will see, transient—conception of an electronic music assemblage. Indeed, the theoretical connection between musical genres and assemblages has been drawn by David Brackett, who writes in *Categorizing Sound*: "The notion that a genre, at a given point in time, articulates together notions of musical style, identifications, visual images, ways of moving and talking, and myriad other factors is akin to the idea of the assemblage."[18] Because the assemblage is characterized by its relations of exteriority, it is useful for showing how the components of a genre cohere at a given historical juncture, as well as how they might (simultaneously) participate in other generic assemblages. In the second half of the 1960s, then, we can see how critics seized on the emergence of a specific set of sonic and procedural features in rock in order to produce a generic affiliation with work that had been done within the domain of "serious" music, despite their myriad differences. But, as we will see, such linkages might merely be tentative. Indeed, while the concept of the assemblage can be used to show how the

[18] David Brackett, *Categorizing Sound: Genre and Twentieth-Century Popular Music* (Oakland, CA: University of California Press, 2016), 10.

manifold aspects of a musical genre can amalgamate and be articulated as a recognizable whole, it can also be used to show how its components might again be pulled apart and plugged into new formations.

Nonetheless, for a time this big-tent conception of electronic music was stable enough that the prospect of crossover between the separate audiences of electronic popular music and the classical avant-garde was pursued by record labels. John McClure, the head of Columbia Masterworks, for example, was optimistic about the possibility that recordings of new, avant-garde electronic works might appeal to audiences weaned on rock. In a 1967 *New York Times* piece, their music critic, Theodore Strongin, described McClure's beliefs thusly: "[He] feels that pop and classical creators are overlapping more and more in their use of electronic sound.… He predicts that when teen-age pop-rock fans get to colleges and hear what comes out of classical electronic recording studios, the young fans will feel at home because of their electronic pop-rock backgrounds."[19] By the same token, music educators concerned with the acceptance of electronic music viewed early exposure through film, television, and popular music as an important gateway.[20] But the prospect of commercial and artistic crossover was largely held to be one-way. While rock audiences were treated to a regular take on recent electronic music releases in Edmund O. Ward's "Electronic Roll" column for *Rolling Stone*, a similar feature amongst the discourses of the avant-garde was nowhere to be seen.

Whatever aesthetic predilections were shared by the audiences of rock and avant-garde electronic music, these points of contact remained tentative. Indeed, even as the popular press suggested linkages, representatives on both sides put the legitimacy of the other into question.

[19] Theodore Strongin, "When Teen-agers Get to College…", *New York Times*, December 10, 1967, 192.
[20] See, for example, Eunice Boardman, "New Sounds in the Classroom," *Music Educators Journal* 55/3 (November 1968): 62-65; and David Friend, "The Sound-Generation Gap," *Music Educators Journal* 55/3 (November 1968): 97-98.

These debates became especially heated in the wake of Wendy Carlos' *Switched-On Bach*, a recording that brought the sounds of the synthesizer into more homes than any other before it. As record executives were considering the market for an ostensibly unified generic space called "electronic music," *Billboard* noted: "According to Russ Bernard, assistant to Bill Farr, Columbia's marketing vice-president, the pop Moog album will be used as a vehicle for legitimizing electronic music. Heretofore, he pointed out, only the sophisticated and/or avant-garde consumer was receptive to electronic music."[21] But if marketers might judge the work of the avant-garde according to an inflexible set of commercial standards, the avant-garde could likewise judge popular works against an inflexible set of aesthetic standards. As Hubert Howe, a Princeton-educated composer of electronic music, noted in a *Perspectives of New Music* review of *Switched-On Bach* and the *Nonesuch Guide to Electronic Music*:

> The most surprising aspect of the Moog Synthesizers, however, which is reflected both in *Switched-On Bach* and "Peace Three" [from Paul Beaver and Bernie Krause's *Nonesuch Guide to Electronic Music* (1968)] is that they do not readily encourage thinking about music in new ways. Indeed, most of the recorded music produced on Moog Synthesizers is extremely conventional in terms of its pitch and rhythmic structure. This is further reflected in the fact that many less serious musicians, such as rock groups, are now becoming Mr. Moog's prime customers.… The fact that the Moog Synthesizers can generate any sound is less significant in this connection than the fact that they can generate stuff like "Peace Three" and *Switched-On Bach* with much less effort.[22]

[21] Mike Gross, "Moog the Medium as Cos. Get Electronic Message," *Billboard*, July 26, 1969, 1, 8.
[22] Hubert S. Howe, "Recent Recordings of Electronic Music," *Perspectives of New Music* 7/2 (1969): 180.

For many critics allied with the classical avant-garde, their principal criticism of popular musicians was predicated upon these musicians' failure to fully realize the radical potential of these new devices. As Milton Babbitt quipped in an interview published in the *Music Educators Journal*'s 1968 special issue on electronic music: "Why bother with these complex machines, why bother with the sophistications and the almost lack of limitations of the electronic medium, if all you're going to produce are these rudimentary compositions?"[23] If, as Jacques Attali writes, new musics are dependent upon new instruments, then the synthesizer in the hands of Moog's new customers was a resource squandered.[24] Indeed, it is significant to note that the commentators who used this "big tent" conception of electronic music tended to be those with a vested interest in trend-spotting: critics in the popular press and record executives. Though the discourses internal to the classical avant-garde periodically made note that electronic means had been accepted by popular musicians, such works were never included in any discussion of electronic music.

Even this cursory glance at the discourses linking rock and classical music through a shared interest in and engagement with "electronics" reveals a variety of ways that the term "electronic music" might be made to function. For some critics, like Ahlman, the term refers to any music whose production or consumption has been impacted by electronic technologies. For critics like Micklin the term functions relationally, shifting its referent as new technologies

[23] Milton Babbitt, "Interview with Milton Babbitt," *Music Educators Journal* 55/3 (November 1968): 61.
[24] In his chapter on composition, Attali writes: "Inducing people to compose using predefined instruments cannot lead to a mode of production different from that authorized by those instruments. That is the trap." Jacques Attali, *Noise: The Political Economy of Music* (Minneapolis, MN: The University of Minnesota Press, 1985), 141. Indeed, the subsequent history of Moog's instruments is a tale of restricting possibility, first with the development of preset boxes for the Moog's live appearance at the New York Museum of Modern Art's 1969 Jazz in the Garden series and, later, the commercial development of the Minimoog. Trevor Pinch's work, both independently and with Frank Trocco in *Analog Days*, has done much to highlight this aspect of the Moog's development. See Trevor Pinch and Frank Trocco, *Analog Days* (Cambridge, MA; London: Harvard University Press, 2002), especially chapters three and eleven. See also Trevor Pinch, "Technology and Institutions: Living in a material world," *Theory & Society* 37/5 (2008): 461-483.

emerge, as the horizon of "electronic-ness" recedes further into the distance. For critics like Schrader and Judd, the term describes a specific approach to working with electronic sound technologies, which is rooted in a specific history of artistic and technical achievement. The term "electronic music" was also applied to some popular works that incorporated aspects of this aesthetic, and was then used as a marketing term to capitalize on popular musicians' endorsement of heretofore commercially marginal avant-garde composition.

4.2: Everybody's Going to the Moog

If the sonic experimentations of rock musicians between 1966 and '67 had laid the foundation for a tentative alliance with the compositions of the experimental avant-garde, then the sudden commercial success of *Switched-On Bach* prompted an explosion in 1969 of electronic renditions of a variety of musics intended to capitalize on the trend. The Command label was especially quick (and prolific) in its productions, which included *Moog: The Electric Eclectics of Dick Hyman*, *The Age of Electronicus*, *Genuine Electric Latin Love Machine*, and *The Copper-Plated Integrated Circuit.* Limelight (*Moog Groove*), RCA (*Hugo Montenegro's Moog Power*), Decca (*Switched-On Bacharach*), Audio Fidelity (*Music To Moog By*), and others also released Moog records that year. While these recordings haven't secured an enduring place in the canon of Western popular music, their sudden irruption into the public sphere signaled simultaneously a growing curiosity and appetite for electronic sounds, as well as the applicability of those sounds to a body of music far from the aesthetic prerogatives of "serious" composers. Furthermore, they helped to cement the idea that music made on a synthesizer was to be heard as "electronic music" regardless of the repertoire that it came from.

One of the principal themes structuring the reception of the synthesizer was its perceived complexity. Prior to the advent of the Moog, the term "synthesizer" was closely associated with the RCA Mark II, a massive, wall-sized instrument installed at the Columbia-Princeton Electronic Music Studio. (Indeed, Moog was initially wary about referring to his instruments as synthesizers because of the strength of this association.)[25] The unique attraction of the "Victor," as it was known, was the prospect of automating many of the processes involved in the creation of electronic music that had previously been carried out by cutting and splicing tape. Although RCA originally funded the venture to supply computer-generated popular hits, and thus avoid the cost of paying union dues for an entire ensemble of musicians, its feedback-less interface (a roll of paper punched with operating instructions) ultimately proved to be well-suited to the formalist mindset of composers writing in a variety of idioms influenced by serialism. Indeed, some of the decade's most significant avant-garde electronic works were written with the instrument, including Milton Babbit's *Philomel* (1964) and Charles Wuornien's Pulitzer Prize-winning *Time's Encomium* (1969).

When Moog's instruments began to take off, these associations carried over. Although the commercial success of the Moog synthesizer was ultimately at the hands of musicians working in popular idioms, his initial vision was to create an instrument suitable to the needs of "serious" composers. And before the complex, patch-based modular system of the instrument became streamlined in the first Minimoog, the open-ended design of the instrument (as well as its lack of an instruction manual) reflected the assumed knowledge of its purchasers. Once the instrument became a notable topic in the popular press, journalists found themselves having to do a fair amount of explaining in order to give readers a sense of how the instrument worked. Edmund

[25] Pinch and Trocco, *Analog Days*, 67.

Ward's *Rolling Stone* article on the Moog synthesizer, for example, begins with a basic overview of the physics of timbre before describing the features of the instrument itself.[26] This point was further emphasized in interviews with Moog. In an August 1969 *New York Times* piece topically entitled "Is Everybody Going to the Moog?", the instrument's inventor rebukes the recent slew of recordings featuring his synthesizer because of their generally low quality, noting "there are maybe 25 people in the world who have the necessary competence in both physics and music" to properly use it.[27]

Whatever its complexities, the promise of the instrument was clear. As *Rolling Stone* succinctly put it, the synthesizer is "a highly sophisticated electronic device capable of producing the timbre—and thereby the sound—of any instrument."[28] And, in a marketplace besotted with sonic novelties, the Moog synthesizer found eager reception amongst rock musicians. As Trevor Pinch and Frank Trocco write, one of the crucial turning points for the Moog's market was the Monterey Pop Festival. The festival demonstrated the commercial viability of the experimental psychedelic sounds emerging from places like San Francisco and London—especially the work of Jimi Hendrix, whose performance at Monterey was well received—which meant that record labels were ready to provide financial backing to groups whose sounds had previously seemed marginal. Paul Beaver and Bernie Krause, who were then working as West Coast representatives for Moog, had set up a demonstration booth for the instrument at the festival. As Krause recalls, several groups used their record advances to acquire a synthesizer: "I think we probably sold six or seven synthesizers at $15,000 a crack at that concert alone in maybe one afternoon. I mean, it was, like, unbelievable."[29] Indeed, in short order many of the most successful of that decade's

[26] Edmund O. Ward, "Records," *Rolling Stone*, May 3, 1969, 27-28.
[27] Donal Henahan, "Is Everybody Going to the Moog?", *New York Times*, August 24, 1969, D15.
[28] "An AFM Ban on the Moog Synthesizer?", *Rolling Stone*, April 19, 1969, 10.
[29] Pinch and Trocco, *Analog Days*, 118.

rock musicians had ventured to acquire one, including the Rolling Stones, the Beatles, the Beach Boys, the Electric Flag, the Grateful Dead, the Byrds, and the Monkees.[30] The staggering costs of Moog's modular instruments meant that they could only be purchased by the richest groups, academic departments, as well as a few enterprising composers.

But unlike the supposedly "easy-to-play" instruments of rock, the Moog synthesizer was a complex instrument that demanded a large investment of time before even its most rudimentary functions could become accessible, let alone second nature.[31] Thus, musicians seeking to work with the instrument needed training and assistance from technicians, such as Jon Weiss, who flew to London to deliver an instrument to the Rolling Stones and to show the group how to use it. Indeed, the dependency of rock musicians on technicians to achieve any workable result in their earliest forays with Moog's synthesizers could foster an unusual dynamic concerning agency and authorship. Dick Hyman, for example, a prominent keyboardist with a long career who was active in the 1960s producing arrangements of popular songs, worked with Walter Sear to develop the sounds used on his *Moog: The Electric Eclectics of Dick Hyman* (1969) and *The Age of Electronicus* (1969). As Hyman remarked, "Sometimes I'd just say to Walter, 'Surprise me with some sounds.' Then he'd fix things up a certain way and I'd just play whatever music

[30] Even if these musicians did not play the instrument live on stage, their celebrity certainly helped to solidify the Moog synthesizer's status as the principal instrument of electronic music. While electronic instruments like the Theremin and the clavioline had been featured on commercially successful recordings, they were typically played by session musicians and therefore didn't benefit from the same level of name recognition that the Moog did. Indeed, in the Donal Henahan piece cited earlier, the caption under the photo of Robert Moog provides a succinct summary of the most relevant information: "Robert Moog, with his synthesizer, at the Museum of Modern Art Thursday. The Beatles and Stones own one." See Henahan, "Is Everybody Going to the Moog?".

[31] In this respect, the Moog parallels the first moderately successful electronic instrument: the Theremin. Although its operation is relatively simple, especially by comparison with the Moog, the Theremin's lack of haptic feedback nonetheless made it difficult for musicians to perform melodic lines with good intonation. Given this difficulty, the instrument quickly became associated with a type of gesture that was remarkably easy to achieve and nonetheless novel: the swooping glissandi featured in science fiction film scores and sound design. Those musicians who did develop sufficient skill on the instrument, such as Clara Rockmore and Dr. Samuel Hoffman, had a virtual monopoly on session work demanding the instrument. For more on the history of the Theremin, especially concerning its usage in popular music, see chapter one in Mark Brend, *Strange Sounds: Offbeat Instruments and Sonic Experiments in Pop* (San Francisco: Backbeat Books, 2005).

that combination seemed to suggest."[32] And while Keith Emerson, the virtuoso rock keyboardist who rose to fame with the Nice and later ELP, did not collaborate directly with a programmer for his Moog modular, his instrument came equipped with an additional box that allowed him to move instantaneously between six basic sounds. As Emerson notes, "those six sounds became the basis of the ELP sound," although ELP's producer, Eddy Offord, has also asserted credit for developing these sounds.[33] Perhaps one of the most (in)famous examples of this is the track "No Time Or Space" from George Harrison's *Electronic Sound* (1969), which was originally credited to Harrison with assistance from Krause. Krause has indicated that the track was edited together from a demonstration of a Moog III synthesizer that he performed for Harrison without knowledge of it being recorded.[34] After confronting Harrison about the material, Krause's name was struck from the original LP pressing, though it has emerged again on subsequent releases. Regardless of the precise nature of the two individuals' contributions to the recording, the anecdote highlights the inherent tension between the Moog synthesizer's newfound popularity amongst popular musicians and its steep learning curve.

A further problem encountered with the Moog in its first years of widespread public attention was the difficulty of employing the instrument in a live performance. Indeed, these instruments were treated principally as studio technologies. This was, in part, a result of the instrument's complexity. In the pre-digital era, patches could not be saved and recalled at will. This meant that the performer would need to manually change the routing of the instrument's modules and adjust the values of its various parameters, a time-intensive task that was often exacerbated by typical concert lighting conditions. If a musician or group required a single

[32] Leonard Feather, "Unearthly Results: Moog Offers Exciting Music Concepts," *The Austin Statesman*, March 4, 1969, 12.
[33] Keith Emerson quoted in Pinch and Trocco, *Analog Days*, 205.
[34] Pinch and Trocco, *Analog Days*, 124.

synthesizer to produce several different sounds over the course of an entire performance, the task of patching could add significant stress and delay to the proceedings. Furthermore, these early synthesizers were monophonic. While the recording studio allows an artist to overlay several tracks produced by a single instrument (this is, in fact, how *Switched-On Bach* and other contemporaneous Moog albums were made), these works could not subsequently be reproduced live on a single instrument. While the preset boxes developed for Moog's August 1969 MoMA concert and the release of the Minimoog in 1970 did much to abate the first problem, the live realization of multitracked electronic works became feasible only later in the 1970s as both synthesizer voice counts went up and costs went down.[35]

4.3: The Musician as Tinker

Thus, while the new sonic prospects of fully electronic instruments like the Moog synthesizer were enticing, the pace of their adoption was nonetheless tempered by their high cost and complexity, as well as the various impracticalities of their use in live performance. Nonetheless, in the interstice between the Summer of Love and the release of the Minimoog in 1970, several groups of musicians explored alternative paths in pursuit of blending rock idioms with other kinds of electronic instruments. One of the most striking approaches was to create homemade devices, assembled either by someone in the group or an associate. In this section, I'll focus on the work of two groups who made use of such one-of-a-kind instruments: San Francisco's Fifty Foot Hose and New York City's Silver Apples.

[35] Another important concern is the stability of pitch in analog oscillators. Like the germanium transistors discussed in the previous chapter, the performance of these components is subject to temperature variation. Digital synthesizers, as well as digitally controlled analog synthesizers, are much more exact in their pitch than were these early designs. Even for those purists who prefer the sound of such temperamental instruments, new technologies such as tuning pedals have helped performers to compensate for pitch-related problems in live performance.

All of the musicians to be discussed here came of age in the postwar years, a period when tinkering with electronics emerged as a popular domestic activity alongside the suburban expansion discussed in chapter one. This hobby field was supported by the emergence of new magazines like *Popular Electronics*, which began publication in 1954 and provided instructions and schematics detailing the operation of a variety of basic circuits, including those capable of generating and altering audio signals.[36] Such efforts were also aided by the recent development of the transistor and its conveniences, as well as the availability of inexpensive surplus electronics after the war. Furthermore, domestic tinkering with electronics benefited from positive cultural associations, including the idea that such hobbies were productive and transformed leisure time into an occasion for innovation. Over the course of the 1950s, this kind of hobby pursuit was viewed positively as an expression of individual will against the perceived conformity of the corporate work environment. Indeed, this was precisely the "new breed of American" championed by *Life* in their 1962 special, discussed in chapter two.

The gendered nature of this tinkering culture in its relationship with the production of sound technologies has been widely critiqued by a variety of scholars, including Tara Rodgers, Keir Keightley, and Steve Waksman. Rodgers has critiqued the way in which the history of the synthesizer and synthesizer culture has been written as a narrative of heroic male tinkers (most notably Robert Moog), to the exclusion of a variety of female agents including composers and an engaged listening public.[37] Keightley's work on the gendering of hi-fi culture highlights the way

[36] After the vogue for electronic popular music at the end of the 1960s, a new crop of instructional texts on "electronic music" emerged. These practical guides combined discussion of history, physics, technique, and style in order to furnish readers with a variety of different generic affinities with a feasible pathway into a big-tent conception of electronic music. See, for example, Judd, *Electronics in Music*; Robert Brown and Mark Olson, *Experimenting with Electronic Music* (Blue Ridge Summit, PA: Tab Books, 1974); and John Jenkins and Jon Smith, *Electric Music: A Practical Manual* (Bloomington, IN; London: Indiana University Press, 1975).

[37] Tara Rodgers, "Tinkering with Cultural Memory: Gender and the Politics of Synthesizer Historiography," *Feminist Media Histories* 1/4 (Fall 2015): 5-30.

in which a dichotomy between "authentic" and "commercial" consumption of hi-fi products emerged in relationship to the "anti-commercial" nature of its earliest participants: "small craftsmen and do-it-your-selfers."[38] The act of tinkering allows the consumer to exercise skill and judgment in the act of investing the object being worked upon with some degree of individuality—a value whose close association with rock culture I interrogated in chapter three—and is therefore able to escape some of the negative associations of consumerism (e.g. passivity, alienation). In turn, this association maps back onto a gendered dichotomy between "active" and "passive" modes of consumption, which have also been used to characterize differences between rock as "masculine" and pop as "feminine." As Waksman writes, the growing popularity of these activities amongst men in the postwar years was a product of two desires: "the desire to recover manual labor as the proper realm of masculine activity at a time when many men found themselves part of a growing class of white-collar workers; and the desire to carve out a distinctly masculine sphere within the increasingly isolated, feminized space of the late Victorian suburban home."[39] Indeed, this male tinker archetype is a subset of a broader twentieth-century move to articulate technology as a strictly male domain, a phenomenon that Ruth Oldenziel has detailed in her *Making Technology Masculine*. Oldenziel links the emergence of this gendered conception of technology to the incredible growth of the engineering profession at the end of the nineteenth century and the increasingly heterogeneous specialties and identities of those who came to hold the title. As engineering moved from "an elite profession into a mass occupation," the engineer was asserted as an ideal model of middle-class, white masculinity.[40]

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[38] Keir Keightley, "'Turn It Down!' She Shrieked: Gender, Domestic Space, and High Fidelity, 1948-59," *Popular Music* 15/2 (May 1996): 157-58.
[39] Steve Waksman, "California Noise: Tinkering with Hardcore and Heavy Metal in Southern California," *Social Studies of Science* 34/5 (October 2004): 675-702.
[40] Ruth Oldenziel, *Making Technology Masculine: Men, Women, and Modern Machines in America, 1870-1945* (Amsterdam: Amsterdam University Press, 1999), 11-12.

4.3.1: Fifty Foot Hose

Fifty Foot Hose is the brainchild of Louis "Cork" Marcheschi. After developing an early interest in gospel and R&B music, he found abundant work as a bassist in San Francisco in the early 1960s and played regularly with an R&B group called the Ethix until they disbanded in 1966. Simultaneously, he began to develop an interest in avant-garde music and poetry, especially the work of Edgard Varèse, which he found to be a natural part of San Francisco's North Beach neighborhood where he was regularly working. Indeed, the activities of local artists such as Don Buchla and the composers associated with the San Francisco Tape Music Center also informed Marcheschi's transition from R&B to experimental styles of rock. After the Ethix folded, he began working gigs organized by the Musician's Union and, after a time, met a guitar player called David Blossom with whom he shared an interest in the emerging psychedelic music and art. Both were interested in the novel sounds being produced by artists like Hendrix, and wanted to form a group that would exploit the possibilities inherent in electronic instruments.

Marcheschi's approach to electronic music would be strongly shaped by his contemporaneous activities as a visual artist, as well as some formative experiences that shaped his attitudes about technology and learning. Beyond his musical work, Marcheschi's professional life has been primarily in the visual arts, and much of his work from the 1960s and 70s was anchored in his fascination with electricity and, especially, electric light. This interest was first fostered in an experience that is paradigmatic of tinkering. In an introductory video in his online portfolio, he describes his background and begins with a formative moment when, during a particularly hot California summer, he found refuge in his parents' basement. There he discovered Christmas lights and glass bottles and, with a friend, began to experiment with light projections. Throughout the video he emphasizes the importance of learning by doing, even

without prior knowledge of the task at hand. A particularly striking moment comes while he reflects on an experience attempting to rebuild a car donated by the shop teacher at his high school in San Mateo: "It was a remarkable experience, and it certainly let me know, and the other guys that I worked with, that you can learn engineering, you can learn mechanics, you can learn any of that stuff by doing it. And no one needs to give you permission, other than 'go ahead and do it.'"[41]

This exploratory, improvisational approach to working with technology is reflected in the electronic instrument that he built for Fifty Foot Hose. In an interview with the underground music magazine *Ptolemaic Terrascope,* Marcheschi describes his approach and philosophy:

> I started building little bits and pieces of electronic noisemaking devices which just became more sophisticated as time went on. The attitude was always to create something, not to purchase something, not to buy a piece of equipment that another person could have, but personalize an instrument… Develop an instrument that is your own that not only makes sounds you are interested in, but the way that it functions comes from something that you're very comfortable with physically as well as intellectually.[42]

Marcheschi's instrument-building practice is intended to invest his creation with aura; the relationship that he establishes between its individual nature and a rejection of the negative values of mass consumption is striking in its similarity to the values ascribed to DIY electronics enthusiasts in the 1950s. What's more, while Marcheschi's instrument involved components that

[41] "Cork Marcheschi: An Introduction," Cork Marcheschi video, 14:04, accessed June 26, 2017, http://www.corkmarcheschi.com/index2.php.
[42] Jim Powers, "50 Foot Hose," *Ptolemaic Terrascope*, 1997, accessed June 26, 2017, http://www.terrascope.co.uk/MyBackPages/Fifty%20Foot%20Hose%20interview.htm.

were decidedly homemade (including a speaker filled with marbles), he also incorporated commercially available devices including a Hohner Echolette and a pair of Lafayette Radio oscillators. But his choice of commercial components reflects a desire to engage devices beyond the norms of his milieu (e.g. the rock instrumentarium), as well as the power of such bricolage to refocus attention from any constituent part toward the whole assemblage.

On *Cauldron*, Fifty Foot Hose's 1968 release on Limelight, Marcheschi's performances focus heavily on sounds that are markedly "spacey," including the requisite profusion of glissandi and filter sweeps. In many of the songs, the electronics comprise an independent layer of sound, hovering beyond the principally pitch-based accompaniment of the guitars and bass and generally placed lower in the mix. While these parts add timbral novelty and interest, they do not always feel like integral components of the group's songs; it's not difficult to imagine a serviceable cover of one of Fifty Foot Hose's original tunes that dispenses with them entirely.[43] Yet some of the most striking moments on the album are the occasional passages of tight timbral and gestural interplay between Marcheschi's electronics and Blossom's guitar work. The instrumental mid-section of "Red the Sign Post," for example, begins with a swirling electronic sound carried over from the preceding section, processed with delay, distortion, and filter modulation. After the vocals drop out, this electronic sound moves into the foreground for a few moments before a distorted electric guitar enters at a high pitch. Both instruments are treated similarly, and Marcheschi and Blossom focus principally on short-range glissandi and pitch bends. Indeed, until Blossom breaks away from his high-sustain feedback and moves into

[43] I would add an exception here for the electronic transition tracks "Opus 777" and "Opus 11"; the extended instrumental section of "Fantasy," where Marcheschi's electronics occupy the foreground over a dissonant bass and guitar ostinato; as well as the title track, which focuses expressly on electronic timbres (especially modulation of Nancy Blossom's vocals) and *musique concrète*-esque collage techniques in a manner that is not characteristic of the other selections on the album.

bluesier territory, which ultimately reveals his instrument's identity as a guitar, the two performers inhabit a similar sonic space. These moments where Marcheschi and Blossom capitalize on the overlap between their two instruments' affordances are some of the album's strongest, and point toward a tighter synthesis of the aesthetics of electronic music and rock than do the album's otherwise abundant jarring shocks of electronic noise and extended "freak-outs."

While Marcheschi's commentary about his one-of-a-kind instrument highlights the specificity of his personalized interactions with it, it does little to offer insight into the uniqueness of its sound palette. Indeed, in contrast to the examples presented in the previous chapter concerning Eric Clapton and Jimi Hendrix, the emergent capacities of Marcheschi's instrumental assemblage would seem to pertain more to the nature of his personal interactions with the instrument, rather than its resultant sounds.[44] That is, taken together, I would argue that Marcheschi's performances on *Cauldron* do not offer up a coherent, individual idiom that would necessitate that its hearers receive his instrument as significantly different from the other prominent electronic instrument technologies of the period, including the Moog synthesizer and the Theremin. Indeed, perhaps the instrument is most readily heard as a blend of the two, with the supposedly limitless, electronic timbral palette of the Moog unhitched from the stepped pitches of its increasingly common keyboard interface and connected to the fluid sweep of an oscillator (or, similarly, a Theremin), as well as the resultant gestures that such control might suggest. But, if it is difficult to point to what makes Marcheschi's instrument sound unique relative to other electronic experimentation taking place within the domain of popular music at

[44] Nonetheless, as the commentary of harpsichord advocates like Ruth Nurmi and Wolfgang Zuckermann presented in chapter two makes clear, the touch and feel of an instrument is an integral part of its identity and allure. Although it is difficult from a historiographical perspective to precisely account for how Marcheschi's body and instrument cooperate to produce the performances documented on Fifty Foot Hose's recorded output—especially given the band's marginality and concomitant lack of documentation—it remains crucial to record that this is an important aspect of his attraction to the instrument.

this time, it may very well be the recognize-ability of *Cauldron*'s sonic tropes that most readily implicates Fifty Foot Hose's music within the broad genre-assemblage of "electronic music" that I highlighted earlier. Nonetheless, as we will see in short order, the unique composition of another contemporary, DIY electronic instrument was readily heard as possessing a distinctive sound and idiom, and consideration of Silver Apples' Simeon will serve as a useful counterpoint to Marcheschi's creation.

4.3.2: Silver Apples

While Fifty Foot Hose came to rock music with an explicit interest in the more "serious" strands of electronic music, Silver Apples began as a humble bar band. Comprised of members Simeon Coxe III and Dan Taylor, the group formed out of the remnants of the Overland Stage Electric Band, a cover band residing in Manhattan's lower east side in 1967. As the story goes, Coxe—then serving as the group's singer—became acquainted with electrical oscillators after encountering one at a friend's residence, and then subsequently borrowed and played it during a session with the group. While most of the members of the Overland Stage Electric Band were disparaging of the oscillator, Taylor, the drummer, was interested in its novel sound. After the other members quit the group, Coxe and Taylor reformed under a new name, Silver Apples, and worked to develop a sound comprised entirely of electronic oscillators, drums, and vocals.

Contemporary critics received the Silver Apples principally as a rock group, though they also focused attentively on their electronic sound and its unusual source. As Coxe and Taylor worked on writing new music, Coxe continued to expand his instrument by incorporating more oscillators, a wah-wah pedal, and various mechanisms to control the growing array, such as telegraph switches. The resultant, homemade instrument was known as the "Simeon" (fig. 10).

Figure 10. Simeon Coxe playing on his homemade instrument, the Simeon. The name was apparently a promotional effort on the part of the group's record label, Kapp.

Its electronic sound exceeded even the gains that had been made in rock over the course of 1967, and critics positioned the group at a juncture between rock and the field of electronic music: a "pop electronic music band," "the marriage of pure electronics with the rock idiom," an "electronic tribal rock blend," and so on.[45] For Coxe, who was inspired by what he perceived to be the simple and direct expression of early rock 'n' roll artists like Fats Domino, his attraction to the electronic oscillators was not predicated upon any association with the avant-garde but, rather, their expressive possibilities (indeed, Coxe was quick to dismiss any familiarity with

[45] Geoffrey Link, "This Generation: Family of Rock," *The Sun*, April 8, 1969, B6; Ritchie Yorke, "Silver Apples with no strings attached," *The Globe and Mail*, September 30, 1968, 17; "Album Reviews," *Billboard*, June 22, 1968, 48.

academic electronic music whatsoever). Looking back on his career during a 2015 interview with the Peruvian music blog Conciertos Perú, Coxe reflected on the difficulty of staking out legitimacy in the rock field with this unusual instrument in 1968 and '69:

> The kids in the sixties had never heard electronic music in such a way before. They had probably heard things like the more academic and laboratory-produced sounds, but they had never heard it just live on a stage with drums and rock lyrics and that whole attitude about it.… I feel more comfortable with today's audience because I don't have to prove anything. I don't have to show them that real music can be made with buttons and dials and twisting this and that.… You don't have to play a guitar to make music.[46]

Coxe's distance from both rock and avant-garde electronic music strongly inflected Silver Apples' idiosyncratic approach. One of the major questions facing the group was: what type of instrument was the Simeon? During the first few months after the release of their self-titled debut album, critics referred to the instrument with inconsistent terminology such as "an elaborate oscillator" or "a control board," while Coxe himself referred to the instrument as "a collection of electronic equipment."[47] It was not long, however, before the term "synthesizer" started to take hold, and comparisons with Moog's own instruments began to emerge. Indeed, by the summer of 1969, the group was heralded as "the first group to use a synthesizer as an essential instrument."[48] But as Moog's own instruments started to capture the public imagination (for a

[46] ConciertosPeruTV, "Interview with Simeon - Silver Apples (Lima, Perú - 2015)," YouTube video, 12:37, November 12, 2015, https://www.youtube.com/watch?v=e5d4YMKRyAQ
[47] Fred Kirby, "Apples Ring Bell as Electronics Group," *Billboard*, December 14, 1968, 15; Yorke, "Silver Apples with no strings attached."
[48] Mike Steele, "How D'ya Like Them (Electronic) Apples?", *The Minneapolis Tribune*, October 5, 1969, 1B.

period the terms "Moog" and "synthesizer" were used interchangeably) the Simeon's lack of a keyboard controller increasingly set it apart. Commentators often noted the extremely idiosyncratic range of Coxe's performance gestures, which included controlling mid-range pitches with his hands, bass with his feet, and effects such as the wah-wah pedal with a spare elbow. Crucially, if the Moog and the Simeon belonged to the same category of musical instrument, Simeon's lack of experience as a keyboardist precluded his engaging the Simeon with all the tacit, physical knowledge about keyboard performance that such training would entail. Coxe viewed this state of affairs positively, and understood such "limitations" to have contributed directly to the group's focus on repetition, as well as his use of restricted pitch sets and chord changes. Indeed, many of their songs eschew chord progressions entirely.

One of the fascinating byproducts of Coxe's tinkering was that the construction of his instrument remained incredibly fluid during the Silver Apples' tenure as a band. Beyond the single oscillator that Coxe employed on-stage with the Overland Stage Electric Band, the first incarnation of the Simeon used on a recording was comprised of only six oscillators and a wah-wah pedal. This was the instantiation of the Simeon used on the song "Oscillations" from the group's debut record, the first track that they recorded. As the group advanced in their career, their earnings were regularly funneled back into the instrument, and Coxe would continue to add more oscillators. As Coxe later reflected, "There was nothing that was The Simeon. It changed every day. Something broke and had to be replaced every day, or Danny or I would have a new idea, something that we added or subtracted to it. It never was the same."[49] Indeed, the transient

[49] John Diliberto, "Electronic Pioneers Silver Apples on Echoes Tonight," The Echoes Blog, May 26, 2014, accessed June 21, 2017, https://echoesblog.wordpress.com/2014/05/26/electronic-pioneers-silver-apples-on-echoes-tonight/.

nature of the instrument was highlighted in the group's press releases, which placed a special emphasis on the present tense:

> Silver Apples is an organic mechanism composed of the Simeon and the Taylor Drums. The Simeon presently consists of nine audio oscillators and 86 manual controls, enabling Simeon to express his musical ideas. The lead and Rhythm oscillators are played with the hands, elbows, and knees, and the bass oscillators are played with the feet. The Taylor Drums at this point include 13 drums, five cymbals, and other percussion instruments that Danny uses to develop his own mathematically pulsating systems, creating both Rhythm and Melody. As the two artists each create Melody and Rhythm, the resulting sounds interchange and grow to an electronic evocation.[50]

Maintaining the instrument presented a number of practical problems for Coxe. The product of a gradual, ad hoc process of construction, the Simeon was both unwieldy and incredibly fragile. Weak solder joints, mistakenly patched cables, the instrument's inordinate consumption of electricity, and the rigors and idiosyncrasies of late-1960s club performances all contributed to a situation in which Coxe found himself constantly mending the instrument. But despite its frailty, the Simeon's idiosyncrasies contributed to its very uniqueness. In an interview with Coxe published in the magazine *Clash*, Geoff Barrow of the English group Portishead described those aspects of the Silver Apples' sound that were influential on his own work. In particular, he focused on the pleasure of hearing the Simeon's unusual dissonances, its departures from "correct" intonation. Although Coxe would attempt to tune his instrument's

[50] Diliberto, "Electronic Pioneers Silver Apples on Echoes Tonight."

oscillators to a set of predetermined pitches, its components were sensitive to environmental factors including temperature, humidity, radio interference, and the quality of the power being drawn and, as such, drifted unpredictably from what he intended. As Coxe informed Barrow, "We tried our damnest to stay in tune and finally just had to accept the fact that once in a while we were going to sound out of tune.… The audiences didn't have any problem with us being out of tune, it was the other musicians who were critical of us. And music critics."[51]

In their history of the Moog synthesizer, Trevor Pinch and Frank Trocco write: "All the best instruments in some sense do not 'work' as they are supposed to. It is the departures from theoretical models of instruments—the unexpected resonances and the like—that make an instrument particularly valued."[52] Certainly the same can be said of Coxe's Simeon, though there is a certain perverse paradox lurking within; while the instrument's rough nature was the source of certain of its charms, it also made it a terribly impractical instrument to perform with. Indeed, Coxe now works with a smaller and more easily transportable digital recreation of the instrument, a shift that gives him no remorse. With respect to his old instrument, he notes: "To me it's not anything endearing. To me it's this monster that I have to tame every night.… to get out there and make it do something that's understandable and musical."[53] It is a curious point here to see a gap emerging between Coxe's own estimation of the group's significance and that of his fans. Does the musical work that Coxe wishes to realize only exist in his imagination, forever thwarted from manifesting because of technological and environmental mishaps? Does the core interest of the musical work emerge in the various ways that the Simeon veers away from Coxe's intentions? Or, perhaps, does the risk created by the Simeon spur Coxe into actions

[51] "Geoff Barrows Interviews Simeon Coxe III," *Clash*, January 11, 2010, accessed June 21, 2017, http://www.clashmusic.com/features/geoff-barrow-interviews-simeon-coxe-iii.
[52] Pinch and Trocco, *Analog Days*, 223.
[53] Diliberto, "Electronic Pioneers Silver Apples on Echoes Tonight."

he could not have seen before he began to play that evening, as he tries to "salvage" a performance undermined by his own construction? Whatever its ultimate artistic value, the music of Silver Apples remains significant for the way in which it highlights the complex interplay of actions generated by Coxe, the Simeon, Taylor, their audiences, the supply of electricity, the weather, and all of the other agents colliding and co-conspiring in those fleeting moments when it emerged. The Simeon, then, is perhaps one of the best demonstrations of the utility of an assemblage-based analysis of musical instruments, which, as here, prioritizes consideration of the emergent capacities resulting from the relations of exteriority between an incredibly wide range of components. While it may remain analytically futile to prioritize any of these components over the others, as the aesthetic evaluations of Barrow and Coxe attest, all of these variegated factors nonetheless bear some significant impact on Coxe's resultant sounds and performances, and thus must factor into our estimation of what his instrument "is."

But Silver Apples' idiosyncratic instrument raises another question about locating value in music produced with electronic equipment. If synthesizers, broadly speaking, were understood to be capable of producing any sound (provided that the user had the requisite knowledge to produce it), then how was a critic to evaluate the skill exercised in producing it? While the finer, technical points of synthesized sound production might be available to performers and programmers to debate, such knowledge was not readily available to those with no knowledge of using such an instrument. Although instruments like the electric guitar allow for easily legible, visual displays of technical prowess, such communication is not easily available to the synthesist.[54] And while instruments like Moog no doubt demanded a new kind of expertise to

[54] Even for guitar players whose sound is significantly determined by electronic processing, this demonstration of technical skill remains possible so long as the visual mapping of control between performer and instrument remains clear. David Pattie, for example, argues that the technologically mediated guitar tones employed by U2's The Edge can still be heard as "authentic" by fans because he can be identified as the source of the sound: "Here, that

wield competently, music critics likewise searched for new language to evaluate the performers that made of use of it. As the *New York Times*' Donal Henahan remarked in his review of Carlos' *Switched-On Bach*, "What standards of performance virtuosity are we to apply? Unquestionably some things must be harder to do on a synthesizer than others, but how do we know, for instance, that the runaway tempo at which the Two-Part Invention in F is taken is not simply a matter of turning up a tempo knob?"[55] Thus, in the wake of the Moog and its ilk, grasping the "truth" of a performance became increasingly problematic.

One way that performers like Silver Apples were able to distinguish themselves was against the perceived inadequacy of their equipment. A telling review comes from Jules Freemond of *The East Village Other*, who was impressed by the gap separating the quality of Silver Apples' work and the means by which they made it: "The amazing thing is that they make absolutely mind-shattering music with all this junky equipment."[56] In this regard, the measure of a performer's worth is made against their ability to realize a musical result by overcoming a meaningful obstacle in its pursuit. If the "high-tech" Moog can make evocative electronic music easily, then the "low-tech" Simeon invests the experience of hearing their music with an element of the type of satisfaction proper to beating the odds. Indeed, this manner of ascribing value is typical of tinkering. Andy Mackay, author of *Electronic Music* and one-time member of Roxy

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authenticity comes from the fact that the audience knows (as far as it can know) who is responsible for the sounds: if, in the audience's eyes, it is the band, then that in itself is enough to justify the use of the technology, and to mark it as real." David Pattie, *Rock Music in Performance* (Houndmills, Basingstoke, Hampshire; New York: Palgrave Macmillan, 2007), 36. This contrasts markedly with an anecdote recounted by Simon Frith where he watched Vince Clark of Yazoo walk away from synthesizer after the boredom of pantomiming to suggest that he was controlling the group's backing track became too much to bear. As Frith writes, "One reason why synthesizers, drum machines, tape recorders and so on are regarded as 'unnatural' instruments in performance is simply because playing them takes little obvious effort." Simon Frith, "Art vs. technology: the strange case of popular music," *Media, Culture, and Society* 8 (1986): 268. Surely one of the principal reasons that Keith Emerson has become such an important character in the history of the synthesizer is because he developed a visual language of performance that created effects of mastery that were legible to his audiences.

[55] Donal Henahan, "Switching on to Mock Bach," *New York Times*, November 3, 1968, 146.

[56] Jules Freemond quoted in "On the Horizon," *Hullabaloo*, May-June 1968, 20.

Music, discusses this idea in relation to the work produced by musicians like Gentle Fire and, especially, Hugh Davies:

> There was a generally low-tech approach to electronic music in England.… The English have always liked scientific and technical breakthroughs to have a domestic element about them. In some ways, their admiration of a discovery is in proportion to the unsuitable equipment and conditions in which it was produced.[57]

What I find especially compelling about Mackay's description here is the way in which he links the production of electronic music and the pursuit of scientific discovery. Indeed, the pursuit of novel timbres ("weird" sounds) has long been a defining pursuit of musicians interested in synthesizers and other electronic instruments to a degree that exceeds that of other categories of instrument. If the evaluation of a guitar player's skill is made against a stable conception of what that instrument affords (informed, of course, by what other guitar players have done with it), then the evaluation of a performance on a synthesizer or otherwise electronic instrument might be measured against the perceived quality and complexity of the instrument itself.[58] Furthermore, because so much of the evaluation of electronic music is rooted in the interest of the sound—which is, itself, a product of instrument building, whether that "instrument" is the result of patching cables on a Moog or soldering oscillators together in a Simeon—these judgments de-emphasize what a performer is capable of doing in real-time in favor of what they are capable of doing behind the scenes.

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[57] Andy Mackay, *Electronic Music* (London: Harrow House Editions, 1981), 52.

[58] It's important to note here that the synthesizer, as a category of instruments, is vastly more heterogeneous than the guitar. Indeed, different models of synthesizer offer different sets of features that make these kinds of comparisons far more difficult than acoustic and electric instruments.

4.4: The Lowest Tech: The 13th Floor Elevators and their "electric" jug

In light of the means-based evaluative shift prompted by the emergence of the synthesizer into rock, I want to conclude this chapter with an extended reading of one of the lowest-tech instruments that emerged during the 1960s' infatuation with novel sounds: an "electric" jug. The instrument was taken up by Tommy Hall, who played with an Austin, TX-based group called the 13th Floor Elevators. Falling somewhere in the interstice between garage and psychedelic rock, the Elevators were an unusual group for many reasons, including their early adoption of the word "psychedelic" to describe their own music and their serious commitment to performing live whilst under the effects of LSD. Beyond the jug, the group's instrumentation was typical for rock groups of the time, comprising two guitars, drums, and bass.

As I've shown throughout the preceding chapters, the practice of incorporating an unusual, "non-rock" instrument within rock arrangements was standard by the middle of the decade. And the rewards of such borrowings varied widely. On the one hand, certain instruments, such as the sitar or harpsichord (chapter two), might earn a musician or group cultural capital by lending the high status of the instrument to the low status of the genre.[59] On the other hand, a wide variety of instruments, regardless of their status, might garner economic success by providing a gimmick with which to bolster record sales. But the Elevators' work, marked by the presence of the jug, was unusual with respect to both approaches. The jug, a quotidian object repurposed to function in the performance of music, was itself understood as a "low-status" instrument with a long history of association with marginalized racial and class identities. Furthermore, the jug was also

[59] I'm here echoing Bernard Gendron's point about the function of hybrid terms like "folk-rock," "raga-rock," and "baroque-rock," which elevate rock by prepending a higher-status term to it. It should be noted, of course, that these non-rock descriptors all reference genres with distinct conventions concerning instrumentation that found application in rock. See Gendron, *Between Montmartre and the Mudd Club*, 174.

unusual because it was the only instrument that Hall played with the group, and therefore was not specific to any of their songs or arrangements. While an unusual instrument would typically be used to give a single song a novel treatment, using the same marked instrument throughout an entire œuvre remained outside the norm for the time period. These deviations from standard practice were exacerbated by the Elevators' position at the center of an emergent split in rock culture between bands that pursued original (and often experimental) compositions, such as the Beatles and San Francisco's nascent psychedelic scene, and bands that focused on performing stand-out covers of the latest popular hits. Indeed, Paul Kauppila has highlighted the cultural differences between the northern and southern parts of the San Francisco Bay Area during this time period, where the north tended to focus on original songs and listening, while the south tended to focus on cover songs and dancing.[60] Although the Elevators participated in San Francisco's psychedelic scene, all of its members, save for Hall, cut their teeth playing dances. Hall, by contrast, had little musical background. Beyond his jug playing, his contributions to the group primarily took the form of lyrical and conceptual ideas.

Given the precariousness of the jug's placement relative to these major, structuring criteria in mid-1960s rock culture, it is remarkable to observe how the instrument has been repositioned after the group's 1969 demise as one of their most distinguishing features. Indeed, if the novelty of the jug was not always received warmly by audiences in the mid-1960s—an early review in *Mojo Navigator*, for example, noted ambivalently: "They have one guy who does nothing but

[60] See Paul Kauppila, "The Sound of the Suburbs: A Case Study of Three Garage Bands in San Jose, California during the 1960s," *Popular Music and Society* 28/3 (2005), especially 396-398. This point is further corroborated by Elijah Wald in the final chapter of *How the Beatles Destroyed Rock 'n' Roll*, where he discusses the entrenched division between art music and dance music, the Beatles' commercial success with recordings that were not identical to live performances, and an emergent market for popular music that was focused on private home listening rather than public dancing. See Elijah Wald, *How the Beatles Destroyed Rock 'n' Roll: An Alternative History of American Popular Music* (Oxford: Oxford University Press, 2009), especially chapter 17.

boop-boop-boop with a jug"—the sound of Hall's instrument has been routinely positioned in recent years as a precursor to the synthesizer sounds that would dominate popular music in subsequent decades.[61] Jim DeRogatis, for example, writes: "In retrospect, his [Hall's] random noises foreshadow the chaotic synthesizers of Roxy Music, the krautrock bands, and Pere Ubu."[62] Given the high status of these artists amongst "serious" fans of rock music, this rhetorical linkage likewise bestows historical and stylistic importance to the Elevators. Likewise, biographer Paul Drummond describes this instrument as a "mouth synthesizer long before such effects were available" and notes that on some of their recordings it sounds like "some early form of electronic synthesizer."[63] Even the communally edited Wikipedia entry for the group acknowledges the similarity, noting that the instrument sounds "somewhat like a cross between a minimoog and cuica drum."[64] Thus, although the 13th Floor Elevators are not routinely considered alongside other vanguard artists like Silver Apples, Fifty Foot Hose, the United States of America, and Lothar and the Hand People in this loose canon of early electronic rock, their posthumous reception has positioned them in a similarly exploratory vein and has lauded their ability to overcome the perceived limitations of their materials. My contention, then, is that Hall's jug, as well as the manner in which he played it, fits uneasily into the evaluative criteria structuring rock culture during the group's short tenure. Drawing upon the SCOT concept of the "technological frame," in the paragraphs that follow I trace the historical threads contributing to

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[61] *Mojo Navigator* 9, October 17, 1966. The reviewer also noted that, despite its novelty, the "unchanging quality of the jug sound" (as well as Erickson's voice) lent the group's performance a certain "sameness." In this respect, the reviewer's critique of the 13th Floor Elevators was thoroughly in line with those routinely made of avant-garde electronic music performed and played back in a concert setting.

[62] Jim DeRogatis, *Turn on Your Mind: Four Decades of Great Psychedelic Rock* (Milwaukee: Hal Leonard Corporation, 2003), 70.

[63] Paul Drummond, *Eye Mind: The Saga of Roky Erickson and the 13th Floor Elevators, the Pioneers of Psychedelic Sound* (Los Angeles: Process Media, 2007), 74 and 125.

[64] This edit was added by a user called 4.227.136.72 on September 10, 2005. It has remained intact over the course of more than 500 edits to the entry in the intervening years. See "The 13th Floor Elevators," Wikipedia, accessed June 28, 2017, https://en.wikipedia.org/wiki/The_13th_Floor_Elevators.

the jug's low-status connotations and show how the synthesizer's emergence into rock discourse has enabled contemporary critics to construct a revisionary conception of the group that assigns positive value to the jug according to values that were not available while the group was active.

In order to highlight the controversy surrounding the jug, a fitting place to begin is with the group itself. In Drummond's biography of the group, the jug emerges time and time again as the locus for struggles between the group's members over their values and goals as an ensemble. In a recent interview with *Myth Magazine* the Elevators' drummer John Ike Walton spoke out against the validity of the instrument:

> MM [*Myth Magazine*]: It's funny how a stereotypically country music instrument like the jug would help start up the psychedelic genre.
>
> JW [John Ike Walton]: Yeah, well there were some bands in Austin... back in that time, there were, you know, a few guys that would play the jug and the wash tub bass and the basic instruments of that type. But they weren't really instruments.[65]

Walton's pointed assessment of it—that a jug is not "really" an instrument at all—is testament to the deep cultural significance invested in musical instruments. In Karen Linn's oft-quoted formulation, "a musical instrument is more than wood, wires, and glue; the essence of the object lies in the meanings that the culture has assigned to it."[66] This basic premise—that the meaning of an instrument is shaped by, but always exceeds, its materiality—points to the important role

[65] "John Ike Walton Interview with Myth Magazine," *Myth Magazine*, November 15, 2011, accessed April 13, 2016, http://www.texaspsychedelicrock.com/2011/11/john-ike-walton-interview-with-myth.html.
[66] Karen Linn, *That Half-Barbaric Twang: The banjo in American popular culture* (Urbana and Chicago: University of Illinois Press, 1991), xi.

played by musical instruments in mediating the production and reception of musical sound. Given Walton's effective othering of the jug, though, we might extend Linn's formulation to acknowledge the meanings that are actively denied to objects as well.

The practice of using a jug to create musical sound dates back to the spasm and jug bands of the late nineteenth and early twentieth centuries. The groups that developed this style of music were composed primarily of poor, southern African-Americans, and their creative transformation of everyday objects into musical instruments was a practical response to their dire socio-economic conditions. With an embouchure similar to a brass player, a jug performer typically buzzes their lips near the opening of the jug, producing a low, percussive sound not entirely dissimilar from a tuba. The earliest recordings of jug band music emerged in the mid-1920s and, by the end of the decade, the jug came to find periodic employment as a novelty instrument on radio broadcasts, as well. The instrument's introduction into the mainstream was perceived by some as an incursion against established musical values. On January 9, 1930, for example, Elmer Douglass of the *Chicago Tribune* published his reaction to a musical performance broadcast on Chicago's WGN Radio by a Bloomington-based "mouth organ-zither-guitar-jug quartet." In it, he pondered "exactly what an ordinary two-gallon jug has to do with music":

> Presumably the unusual bass blubbs, on pitch and off pitch, and the strange glissandos heard during the selections were attributable to the jug. Quin Ryan [general manager of WGN Radio] intimated that a juggist's task is a hard one.[67]

[67] Elmer Douglass, "Two Gallon Jug Gives Elmer a Touch of Blues," *Chicago Daily Tribune*, January 9, 1930, 30.

Douglass' choice of language makes explicit the jug's otherness from assumed musical norms, especially where ideals of timbre and intonation are concerned. Furthermore, Ryan's intimation articulates the anonymous juggist's "task" as an uphill battle subverted by fundamentally inappropriate materials working contrariwise to the purpose of music-making. The tacitly derisive character of Douglass' assessment of the jug is not altogether atypical for the period. Indeed, in a syndicated article from the Associated Press discussing the weekly performances of an unnamed "Negro boy" on Louisville, KY's WHAS, one finds a similar sense of disbelief that the idiosyncratic musicality of the (racial) "other" might ever find favor amongst adherents of "real" music: "The gurgle of a jug has been called music to the ears of many, but few persons ever expected to hear real musical notes emanating from the mouth of an ordinary jug."[68] Richard Blaustein, citing Harold Courlander, has made the negative framing of this racial entanglement explicit:

> Early white settlers considered the use of spoons, jugs, washtubs, washboards, and other European farm implements by plantation slaves as musical instruments completely makeshift and chaotic, and solely attributable to the blacks' "irrepressible instincts to bang or twang on something."[69]

While this essentialist line of argument attributed by Blaustein to "early white settlers" has typically been used to denigrate the creative contributions of African-American musicians, Ernest D. Brown has rehabilitated it in order to ascribe positive value to what he describes as

[68] "Music From Empty Jug Bring Tunes to Radio," *Hartford Courant*, January 11, 1931, E9.
[69] Richard Blaustein, "Jugs, Washboards, and Spoons: Why Improvised Musical Instruments Make Us Laugh," *Tennessee Folklore Society Bulletin* 47/2 (June 1981): 78.

"making something from nothing and making more from something."[70] Nonetheless, such creative repurposing, while thrifty, has not always been valued positively. As Blaustein notes further, "in our society 'making do' has rarely been held in high regard.… The low esteem in which spasm bands were held by those able to afford 'real' instruments is evident in another term commonly used to describe them: 'hokum' (i.e., fake, imitation) bands."[71]

In addition to the jug's symbolic race and class associations, it also carried connotations with regard to overindulgence and corruption. Indeed, many of the scenes depicted in *Puck*, a satirical magazine founded by Joseph Ferdinand Keppler in the early 1870s, hinge upon a jug at rest for their full import. The size of the instrument is a crucial feature of its capacity to signify; its content is never portioned out in a "responsible" manner, but always consumed fully, often by a single subject, and therefore in excess. In "Uncle Sam's Neglected Farm" (fig. 11) we see two laborers—avatars of the Democratic and Republican parties—brawling beside empty jugs of "Corruption Bourbon" and "Spoils Switchel."[72] There is little room to doubt that the jugs here are framed as the cause of the brawl. In the decades preceding Prohibition, when the jug was first establishing its potential as a musical instrument, the relationship between drinking and politics was an intimate one. Christine Sismondo has written of the perceived stratification between "high" and "low" cultures of drinking and "the veneer of charm that coated the marriage between

[70] Brown is especially adamant about emphasizing the dual identity of African-American musicians as both performers and instrument builders. "A Westerner might not take these musical activities seriously, but these conversions are serious instrument-making efforts. What is important about them is that through these conversions, African people create means to realize culturally determined sound ideals. Furthermore, these conversions recognize that in Africa, ideals of musical sound can be attained with a wide variety of materials." See Ernest D. Brown, "Something from Nothing and More from Something: The Making and Playing of Music Instruments in African-American Cultures," *Selected Reports in Ethnomusicology* 8 (1990): 277-78.
[71] Blaustein, "Jugs, Washboards, and Spoons," 78.
[72] Joseph Ferdinand Keppler, "Uncle Sam's Neglected Farm," illustration, *Puck* 11/285 (August 23, 1982), from Library of Congress Prints and Photographs Division, accessed January 31, 2016, http://www.loc.gov/pictures/item/2012647270/.

Figure 11. "Uncle Sam's Neglected Farm."

drinking and politics at the higher levels."[73] While both echelons depend upon vessels to transport substance to lips, the materials of their drinkware differ radically. The stoneware jugs favored by laborers are dense, earthen, and clumsy, never so much "clinking"—as do the crystalline glasses of the upper classes—as emitting a thud. Indeed, the opaque and asymmetrical jugs of "Uncle Sam's Neglected Farm" sink back into the dirt and grass in the manner of stones.

Although the jug and the jug band repertoire receded from mainstream popular culture during World War II and the years immediately following it, these associations with marginalized identities remained legible when the instrument re-emerged during the UK's skiffle boom and the US's urban folk revival. Indeed, Hall, the Elevators' jug player, came to the

[73] Christine Sismondo, *America Walks into a Bar: A Spirited History of Taverns and Saloons, Speakeasies and Grog Shops* (Oxford: Oxford University Press, 2011), 182.

instrument through his admiration of popular folk revivalists, such as Jim Kweskin, and his participation in Austin's thriving folk music scene. As Barry Shank has written, the folk music scene in Austin was an important community for people of all stripes who defined themselves against the conservative cultural mainstream.[74] As such, participation in or reference to this scene could be viewed as a potential source of cultural capital. But even within this milieu, different instruments can come to embody different cultural meanings based upon their usage. Acoustic guitars and banjos were the signature instruments of the self-accompanied folk-singer, an emergent cultural figure of the early 1960s that Gene Bluestein has described as "irresponsible, incomprehensible, and 'maladjusted'."[75] An anonymous *Time* article from 1962, looking back on the marginal status of the folk singer prior to the increasing commercialization of the genre, explicitly articulates these instruments as the bearer of this symbolic value: "guitars and banjos were once symptoms of hopeless maladjustment."[76] Dissatisfaction is, of course, the wellspring of critique, and the guitar and banjo symbolized the deadly seriousness of the folk singer's enterprise, a point beautifully encapsulated by the text famously emblazoned on Woodie Guthrie's guitar: "this machine kills fascists." By contrast, jug players could not assume the emergent identity of the lone artist critiquing society because, like any wind or brass instrument, the mandates of performance would preclude the presence of text. The jug player, then, was always the member of an ensemble, serving a primarily accompaniment role and providing the occasional solo. Perhaps most importantly, due to its origins as a form of popular novelty entertainment, the affect of the jug band repertoire—which, for example, often makes use of

[74] Barry Shank, *Dissonant Identities: The Rock 'n' Roll Scene in Austin, Texas* (Middleton, CT: Wesleyan University Press, 1994).
[75] Gene Bluestein, "Songs of the Silent Generation," *New Republic*, March 13, 1961, 21-22.
[76] "Folk Singing: Sibyl with Guitar," in *The Pop, Rock, and Soul Reader*, third edition, ed. David Brackett, 149-152 (New York; Oxford: Oxford University Press, 2014).

rather blue language—is decidedly more lighthearted in character than that championed by the "maladjusted." Indeed, this affective character hinged upon the low-cultural register that became associated with the jug in the first half of the century and continued to inflect discourse about the jug during the folk revival. For example, a *Melody Maker* piece introducing readers to the musical jug gives the following instructions: "Obtain a one gallon cider jug, drain the contents, put the jug to the lips and blow across the top. For a more rugged effect, try spitting across. This will come naturally if you drain a one gallon stone ginger beer jug."[77]

The lighthearted, makeshift character of the jug was no doubt legible in a rock context but, as I wish to show now, it was inflected by a particular system of valuation that equated economic value with social prestige, which powerfully shaped teenagers' perception and consumption of music instruments in the mid-1960s. The formative musical experiences of Walton and Stacy Sutherland, the Elevators' lead guitarist, are particularly instructive in this regard. While Hall, singer-guitarist Roky Erickson, and bassist Benny Thurman all began their musical training in the more cosmopolitan environment of Austin, Walton and Sutherland began theirs in the small Texas town of Kerrville. Both musicians came to rock 'n' roll at a young age and both worked in their early teens touring locally with different bands. In 1965, after both men failed out of college, they pretended to be members of an established rock group in order to secure a summer residency at a beach club in Port Aransas. Sutherland and Walton immediately recruited some of their friends, including Thurman, to form a group, which became known as The Lingsmen. Of especial interest are the means by which they sought to legitimize the inchoate band:

[77] Bob Kerr, "Sound Sense: Tell me, how do you blow a jug?", *Melody Maker*, July 5, 1969, 20.

> In order to ensure the booking at the Dunes, they had to be liberal with the truth and pretend they were already a fully-fledged band. This meant that John Ike invested family funds in electric equipment (Stacy a Gemini 2 Rickenbacker guitar, Benny a Fender Jazz bass and Ampex amps) and a Rogers "swivomatic" kit.[78]

This anecdote harkens back directly to chapter one, where I discussed the mounting association between professional-quality instruments and legitimacy amongst teenage bands in the mid-1960s. Given Walton and Sutherland's formative experiences performing professionally in rock 'n' roll bands and The Lingsmen's early instrumental makeover, it is likely that their attitudes toward the potential role of music instruments in articulating professional legitimacy were not dissimilar from those underpinning the era's nationwide culture of teenage music-making. As an instrument that, in effect, cannot be purchased, the jug exposes yet remains apart from the economic hierarchy of the rock instrumentatrium that I've suggested here.

But inasmuch as the symbolic associations of the jug might seem an awkward fit for teenage rock culture in the 1960s, it is nonetheless crucial to also square the instrument itself against the manner in which Hall employed it in the Elevators' music. Indeed, I want to suggest that his performances on this "low" instrument subvert the standard hierarchy of band membership in rock culture, which tends to place its greatest emphasis on the talent and creative contributions of the lead singer and lead guitarist. A good example of this can be heard in the Elevators' "Roller Coaster," an original song included on their 1966 debut album and a veritable showpiece for Hall's idiosyncratic, technologically enabled jug playing. The song begins with a brief instrumental section underpinned by a single A-minor chord, which introduces the song's

[78] Drummond, *Eye Mind*, 22.

signature guitar riff and presents a reserved guitar solo low in the mix. Following the first line of text, Hall enters unexpectedly with the jug on the fourth beat of the second measure of the verse, playing a rising figure comprised of five sixteenth notes. For the first few measures of this section Hall appears to be providing a pitched but principally rhythmic ostinato coinciding with the backbeat provided by Walton's snare drum. While Hall's jug part remains rooted in rapid sixteenth-note divisions of the beat, by the time the harmony shifts to D-minor in the fifth measure of the verse, his phrasing starts to become increasingly irregular.

After the first verse the jug drops out of the texture and the tempo suddenly quickens. This contrast serves both to highlight Erickson's delivery of the characteristically psychedelic pronouncement, "You've got to open up your mind and let everything come through," and to give renewed interest to the jug part when Hall re-enters during the subsequent guitar solo. Due to its irregular phrasing, high register, and prominence in the mix, however, Hall's jug playing largely usurps the foreground position that is typically granted to the "solo" instrument. Sutherland's characteristically sparse playing serves only to further cede the spotlight to Hall. The sonic result is a kind of chaotic double solo.

While rock's instrumentarium—electric guitars and basses, combo organs, drums, and amplifiers—originated as potent novelties, by the mid-1960s these instruments had been firmly established as a norm. A new practice of juxtaposing amplified instruments from diverse historical and geographical origins against a rock band became common, of which the prominence of Hall's jug in "Roller Coaster" is no doubt symptomatic. The cynical interpretation of this practice is that it merely constituted a commercial gimmick. Several members of the Elevators, including Walton, Sutherland, and Danny Galindo, one of the group's replacement bass players, have taken this interpretation with regard to Hall's jug. As "Roller Coaster" attests,

International Artists, the group's record label, clearly recognized the commercial potential of emphasizing the jug as the group's trademark sound and mixed the record accordingly. In so doing the jug, unleashed from its expected bass range and role, came to compete with what are often regarded as a rock group's most important assets: the lead vocalist and the lead guitarist.

The popularity of the 13th Floor Elevators in the mid-1960s was largely a product of their dynamic live performances. Correspondingly, critics of the period paid more attention to the overall quality of the group's sound—and the size of their crowds—rather than any single element of the group, jug included. Today, however, the context for listening to garage rock has radically shifted, as have the styles included under this term. As more and more recordings made in the 1960s become available the assertion of any group's most original and unusual features becomes an increasingly important method for navigating this body of work. Since the late 1980s, when the Decal label released a series of reissues of the Elevators' work, critics have made much of Hall's jug. Edwin Pouncey, writing in 1987 for *NME*, remarked, "It is the obscure talent of… Tommy Hall which gives these selections an extra edge, his playing… made the Elevators something special."[79] Andy Gill, writing for *Q* in 1991, lamented the lack of jug emulation on a tribute album to Erickson and the Elevators, suggesting, "the bizarre, wobbly, amplified jug-playing… was the Elevators' most notable musical characteristic."[80] Though critical opinion of the jug has varied from article to article, few authors since Pouncey have failed to note the significance of the jug, and fewer still have failed to mention it at all.

Although the material features of Hall's instrument and his recorded performances are unchanging, the shift in rock culture's technological frame in the wake of widespread awareness

[79] Edwin Pouncey, "13th Floor Elevators," *New Musical Express*, October 10, 1987, 40.
[80] Andy Gill, "Various Artists: Where the Pyramid Meets the Eye," *Q*, May 1991, accessed April 13, 2016, http://www.rocksbackpages.com/Library/Article/various-artists-where-the-pyramid-meets-the-eye.

of the synthesizer has subsequently altered the way in which that instrument has been interpreted by its hearers. In his analysis of Bakelite, an early type of plastic, Wiebe Bijker introduces the concept of a technological frame as a way of balancing the opposing explanatory tendencies of social and technological determinism, recognizing that social actors and technologies are both capable of giving rise to the other.[81] Pinch and Trocco liken a technological frame to a paradigm, and write in the conclusion of *Analog Days* that a technological frame "captures the way that a whole series of practices, ideas, and values get built around a technology."[82] Before the synthesizer began to make headway into the rock instrumentarium at the end of the 1960s, Hall's jug was interpreted merely as just that: a jug. And, as I've shown here, the instrument's identity as a jug threatens to undermine a conception of legitimacy held by half of the group's members. But once the synthesizer had become a part of rock culture, and after certain habits of use started to crystalize in that generic space that were heard as similar to Hall's style, the jug could subsequently be interpreted as a kind of proto-synthesizer.

Criticism of art is strongly shaped by an understanding of materials, and this shift in technological frame has concomitant effects on the way that we assign value. Indeed, because a technological frame shapes our understanding of what a given artifact is, it necessarily shapes our understanding of what's possible with it as well. Drawing Hall's work with the 13th Floor Elevators into the technological frame of the synthesizer (as critics like Drummond and DeRogatis have done) serves to elevate this music. Having released their debut album in 1966, well in advance of the other electronic rock groups discussed here, the sound of Hall's electric jug becomes "psychedelic" *avant la lettre* and assumes a newfound historical importance in light

[81] See Wiebe Bijker, *Of Bicycles, Bakelites, and Bulbs* (Cambridge, MA; London: The MIT Press, 1995), especially chapter three.
[82] Pinch and Trocco, *Analog Days*, 309.

of the central role that synthesizers now play in the production of rock music. And, like Coxe's Simeon, the utter simplicity of Hall's jug serves to distinguish it against its high-tech peers as a triumph over materials.

4.5: Conclusion: Relatively Electronic Music

"If you look for electronic music in a music store, in what section is it filed? Classical? Jazz? Dance? New Age? Rock? Experimental? Yes."[83]

Meaning is suggested by difference. When the synthesizer entered mainstream musical discourse in the late 1960s, it brought with it the unique notion that, with the right expertise, any sound was possible. And while synthesizers and other electronic instruments may yet continue to present listeners with novel experiences in the future, the initial difference that was then signified by the term "electronic music" has, by and large, subsided. Indeed, Arielle Saiber suggests that the usefulness of "electronic music" might be coming to an end: "by virtue of e-music's omnipresence, velocity, and perpetual splintering, it is on its way to dissolving from a retronym into, simply, music."[84] But if electronic technologies are a ubiquitous means, they nonetheless factor into the affective and aesthetic dimensions of musical experience in very different ways. And this depends, of course, upon the horizon of expectations governing the evaluative criteria operative in different genres of music at different periods in time. In the domain of art music, whose long history extends well beyond the "electronic age," a broad means-based definition of "electronic music" seems sufficient to distinguish it from the acoustic musics of which that

[83] Arielle Saiber, "The Polyvalent Discourses of Electronic Music," *PMLA* 122/5 (October 2007): 1613.
[84] Saiber, "The Polyvalent Discourses of Electronic Music," 1614.

history is predominantly comprised. Indeed, in this generic space the usage of electronic devices remains sufficiently marked for such an otherwise broad descriptor to convey a meaningful difference. By contrast, perhaps, within the domain of popular music, "electronic music" has come to mean little more than a vague truism.

And yet we continue to use the term. Electronics continue to challenge and restructure our sense of what's "natural." The "enhancements" offered by Antares' Auto-Tune software, for example, are only one of the most recent examples of electronics confounding our musical expectations. But if the eerie cleanliness of its use on Green Day's "Wake Me Up When September Ends" sounds more unnatural than Morrisey's un-tuned vocals on "Dear God, Please Help Me," then the marked electronic sounds of Daft Punk, T-Pain, and Songify the News (née Auto-Tune the News) make Billy Joe Armstrong sound natural by comparison. Auto-Tune may be the new norm, but artists and engineers still have control over whether its presence is made to be felt. If "electronic music" remains a meaningful way to describe some songs, albums, and artists, then that fact has less to do with the technologies being used than how they are used and against what norms the result is heard, a meaningful difference that emerges in relationship to shifting practices of musical categorization. Perhaps, then, within the domain of contemporary popular music, "electronic music" is a difference of degree rather than of kind.

Afterword | Weird Musicology Online

On a late Monday afternoon in October, I'm revisiting a number of YouTube videos that I came across while working on this project. In one, uploaded in April 2010, a man wearing a Moog tee-shirt can be seen holding what looks to be a giant, black cylinder with a small keyboard. Its weight is supported by a shoulder strap, and the manner in which it falls upon his body is not entirely dissimilar to that of a bassoon. But, over the course of the video's short minute-and-a-half duration, the sounds emerging from the unusual instrument are anything but bassoon-like. With nary a word of introduction, the man begins with a slow melody in A minor before launching into a bubbly twelve-bar blues in C. With its heavy syncopation and rather futuristic timbre, it would not sound out of place on the soundtrack to *Beverly Hills Cop* (1984).[1]

The instrument is a Tubon, an early predecessor to the keytar, launched in 1966 by the Swedish instrument manufacturer Joh Mustad. I first learned about the instrument from an advertisement while I was doing archival work with *Music Trades Review*, one of the trade magazines that supported much of the research that I carried out for chapter one. Though once pitched as "a certain winner," the instrument is a rarity, and the comments posted below the video are some of the only bits of information about it that I've been able to glean anywhere. One user says that there are photographs showing that John Lennon and Paul McCartney had—or at least had access to—one, and several users offer up suggestions concerning which Beatles songs might have included it. Another user, who claims to have two Tubons, says that the instrument was designed to fill a bass role, though one of their Tubons has tabs for lead sounds as well. Another says that the instrument is actually a clavioline, though yet another counters this

[1] lesingemonotone, "Playing the Joh Mustad AB Tubon," YouTube video, 1:34, April 27, 2010, https://www.youtube.com/watch?v=OgKu1AaUPBA.

and summarizes a few of the competing theories circulating online about what the Tubon really is, as well as what kinds of circuits might lie in its guts.

Nonetheless, YouTube is an inherently problematic source from which to pin down definitive information. Because its content is generated by its users, including both its videos and its comments, the mechanisms for vetting claims and according authority on any given subject are haphazard at best.[2] But for obscure instruments like the Tubon, this one YouTube video offers more information about the instrument than any of the print sources I've come across that mention it (one especially unhelpful article merely described it as a "combination accordion and vacuum cleaner").[3] Nor is my experience unique; fans of such unusual musical instruments regularly use online platforms like YouTube to solicit information from a vast, distributed community of likeminded individuals. For example, in a video tellingly entitled "The original RMI Rock-si Chord? What is this thing??", a pair of men attempting to restore a damaged Rock-si-Chord describe some of their specimen's unusual features with the hope that a viewer—unknown to them personally—might be able to tell them what model it is:

> Parker's got a real interesting item here. This is one we can't find a photo of anywhere. It's a Rock-si-Chord, but most Rock-si-Chords of course have the switches along a metal panel. This thing is all wood. Very crude, early, perhaps a prototype even of the thing. We just can't find any information. So, if anybody has any way to tell…[4]

[2] At the time of writing, YouTube prioritizes trending videos and comments that have been "up-voted" by its users.
[3] Dick West, "Rock 'n' Rollers Can Now Get Even," *Chicago Daily Defender*, September 7, 1966, 12.
[4] sounddoctorin, "The original RMI Rock-si Chord? What is this thing??", YouTube video, 2:58, January 26, 2012, https://www.youtube.com/watch?v=chEwc-IdDtI.

After a bit of back and forth, the various people participating in the conversation seem to agree that it is a model 200. Like the televised displays of musical instruments in the 1950s and 60s, their online exchange is a testament to the way in which the locus of knowledge about musical instruments has continued to shift from manufacturers, to salespeople, to performers, and finally to amateurs.

Over the course of working on this project, I came across the traces of a multitude of by-and-large forgotten instruments. And while I was never aware of an individual or an institution that could provide first-hand access to the vast majority of them, nearly every unknown and hard-to-find device could be found on YouTube, including the Tubon and the Rock-Si-Chord, as well as the Ludwig Synthesizer Phase II, the Conn Multi-Vider, the Vox V251 Guitar Organ, and countless others. As I read about these instruments and watched these videos, I felt compelled to find a way to weave them into my narrative about electrical instruments in popular music of the 1960s. Surely they mattered—if not because of their commercial success, then at least because there were so many of them? Because they seemed so wild for the time period? But just as they would have been heard on the few records that featured them in the 1960s, when studied in isolation from each other these instruments can slip into a kind of musicological gimmickry, a point corroborated by Emily Dolan when she writes, "Odd, unusual, and failed technologies in the history of music can catch the historian's eye and ear more easily. Like 'bad' orchestration, 'bad' technologies are more visible."[5] These words were especially sobering coming from Dolan, as she has been a staunch advocate for musicologists interested in interrogating the technologies that enable, support, and shape musical cultures. But, in her history of orchestral technology and

[5] Emily Dolan, *The Orchestral Revolution: Haydn and the Technologies of Timbre* (Cambridge: Cambridge University Press, 2012), 21-22.

the music of Joseph Haydn, she offers up a compelling warning for those contemplating this material turn:

> Like any study of material culture, investigations of machines can become merely whimsical—an opportunity to wheel out forgotten contraptions that captivate because of their novelty appeal. The New Musicology threatens to give way to what one might call instead the Weird Musicology, in which musicologists subject one another to a parade of quirky historical objects and circumstances that elude serious criticism because they resist any sophisticated dialogical engagement.[6]

As Dolan's scare quotes around "bad" suggest, there is a potential for slippage between the terms that she invokes—weird, odd, unusual, quirky, failure, bad—as they each, in varying measure, have the potential to suggest difference from a norm, unsuitability for achieving a goal, or poor quality. The last of these, however, is an uncommon evaluation to posit with respect to an entire category of instrument.[7] Rather, a poor-quality instrument is typically an individual instance of a type, one that is badly made or broken, incapable of serving its intended function.[8] Thus, these terms serve primarily as a way of both measuring distance and staking out a center from which that distance should be measured.[9] As such, it is rather difficult to discern whether or

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[6] Dolan, *The Orchestral Revolution*, 21.

[7] This is a marked contrast with a number of musical genres that have often been dismissed categorically by outsiders, including heavy metal, country, easy listening, smooth jazz, and others. A useful collection that theorizes the values at stake in deriding entire genres of music is Christopher J. Washburne and Maiken Derno, eds., *Bad Music: The Music We Love to Hate* (New York; London: Routledge, 2004).

[8] For the sake of this discussion, I am discounting genres such as lo-fi and glitch, which aestheticize "cheap" sounds and technological failure. I would contend that pursuing this usage of music technology simply establishes a new goal or function, which is then properly served by employing "bad" equipment or "misusing" an instrument.

[9] Even commercial failures, evaluated on such incontrovertible data as sales figures and bankruptcy filings, need to be considered in relation to the nature of the product, market size, competition, and so on.

not an instrument is "bad" or "good" of its own merits beyond any specific musical context and expressive goal. Nonetheless, as I have endeavored to show in these pages, musical instruments are routinely judged independently of the music made with them or, at least, without explicitly stating the context in which such an evaluation should be understood. The jug is not a "really" an instrument (in a particular rock context).[10] Jerome Markowitz's electronic harpsichord should be "eliminated altogether" (from performances of baroque music).[11] Electric sitars are only appropriate for "light music" (and therefore not appropriate for Hindustani classical music).[12] The gimmicks of the recording studio are "phony instrumental sounds" (and therefore shouldn't be employed by an "authentic" rock band).[13] In this respect, each negative evaluation of an instrument is also a statement about the rules governing legitimate participation in a musical genre. These invectives are a strong testament to the thorough entanglement of technology and genre, as each participates in the production of the other.[14] Furthermore, each of these critiques stakes a particular claim about musical legitimacy. As the examples above attest, instruments play an important role in the creation and distribution of prestige, as the derided instrument in each instance is understood to belong to a genre that is of lower cultural status.

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[10] "John Ike Walton Interview with Myth Magazine," *Myth Magazine*, November 15, 2011, accessed April 13, 2016, http://www.texaspsychedelicrock.com/2011/11/john-ike-walton-interview-with-myth.html.
[11] Wolfgang Joachim Zuckermann, *The Modern Harpsichord: Twentieth-Century Instruments and Their Makers* (New York: October House Inc., 1969), *The Modern Harpsichord*, 77.
[12] Theodore Strongin, "Now Indian Sitar Can be Turned on: Instrument is Electrified for Rock 'n' Roll Groups," *New York Times*, November 4, 1967, 37.
[13] "Vanilla Fudge tour," *Beat Instrumental* 54, October 1967, 24.
[14] It's worth considering, as well, the generally underdetermined nature of musical notation with respect to instrumentation. For example, the manuscripts and scores containing the written instructions for realizing baroque harpsichord music do not specify that these works should be realized on an acoustic harpsichord because it is taken for granted by the vast majority of that music's adherents that an electrical harpsichord would be inappropriate. But more to the point, in this generic context electrical harpsichords and acoustic harpsichords are not different varieties of a common type of instrument; they are different kinds of instruments entirely. Despite its "authentic harpsichord sound," Rameau should not be played on a Rock-si-Chord precisely because it is not a harpsichord, a category whose bounds have been tightly policed by the community of people participating in and producing the genre.

The technologies employed in music-making, then, exert a powerful influence with respect to the material and symbolic rewards afforded to musicians, as well as the related personnel and industries that support their craft. And while much can be gleaned from close study of the best known and most widely used instruments, musicologists and historians should also be sensitive to the potential utility of weird artifacts to unsettle the received histories that have given shape to the present. Though devices like the Tubon were dreamed up in an era when musical instruments were a staple of popular culture, their strangeness nonetheless restricted them to the periphery of that culture. It is the production of this very strangeness that disciplines like SCOT and ANT have encouraged us to interrogate. Failures—whether commercial, popular, aesthetic, or otherwise—are worth studying because they illuminate the myriad agents that contribute to the normalization of historical narratives and evaluative frameworks. Like musical genres, technologies are subject to competing interpretations and reinterpretations over the course of their social lives, which gradually shape their bounds, their structures, their uses, and their meanings. Whatever the potential merits of a given instrument, the relative plasticity or obduracy of the categories it aligns with will nonetheless affect how it can be touched and heard. The many peculiar instruments that I have addressed throughout this project are useful precisely because they cut across the taken-for-granted boundaries separating one type of technology from another and, in so doing, both register those divisions and question the very utility of the premises upon which they are based. Though the categories that an instrument participates in will no doubt accrue inertia gradually through processes of citation and iteration, the structure and function of a musical instrument are never guaranteed a final or even a classic form. As chapter two's example of the "amplified ancients" perhaps best demonstrates, even old instruments can be reimagined and put to novel use, regardless of whether or not they are

universally accepted. So too can the presence of electricity itself be continually obscured and brought back to the fore, as it is employed in the production and felt in the experience of music in ever-new and unforeseen ways.

Nonetheless, this work interrogating how musical instruments fit within a broader cultural politics of categorization must also attend to potential slippage in the act of merely identifying an instrument. Indeed, as I have shown throughout this project, what an instrument "is" isn't always clear. Although Hall's voice and microphone were integral components of his idiosyncratic performances, the jug easily eclipsed these other technologies in the critical reception of the 13th Floor Elevators' work. So too did Clapton and Hendrix's guitars overshadow the amplifiers, effects pedals, studio technologies, and people involved in the production of their unique musical contributions. (Indeed, as we've seen, these musicians were very much involved in managing knowledge about what their instruments were and could do.) Even in those instances where musicians acknowledged and even touted the chaotic bricolage of their instruments, as we observed with the home-made devices employed by Fifty Foot Hose and Silver Apples, the most significant musical details might nonetheless be the byproduct of a huge array of interactions between people, technologies, environments, and more.

In order to grapple with the range of agents that might bear upon the major features of musical works and performances, I have suggested employing the concept of the assemblage as a site of inquiry into the myriad lines of force inflecting the processes that generate and structure sound. From a musicological perspective, the strength of the assemblage is its analytical utility in highlighting those components that might otherwise escape notice but nonetheless make a significant aesthetic difference. This last point bears stressing. Musical performances and works emerge from interactions between a theoretically limitless array of assemblages and components,

which are themselves also assemblages. In order to avoid unnecessary overburdening, it is thus the analyst's task to explicate where a significant difference is produced in the emergent capacities of an assemblage, and why it matters in a given musical context. My contention, then, is that an assemblage-based analysis of musical instruments and resultant works benefits from close reception study. As this project demonstrates, listeners can and do bring very different competencies and expectations to bear upon their experience and evaluation of a piece of music. Reconstructing the horizons of expectation at play in any historical period is a necessary step toward elucidating how and why certain features of a musical work are prioritized over others. In turn, the assemblage allows us to show in fine detail how those features come to be.

With respect to the assemblage, then, the main theoretical contribution of this project has been to show how this tool might be used to analyze musical instruments in performance. But, as the work of its intellectual progenitors attests, the assemblage is also well suited to describing the shape and motion of social structures. Thus, in chapter one, for example, I showed how a static conception of consumers might be exchanged for a more dynamic notion of an assemblage of both purchasers and a variety of taste-shaping agents, which produce desiring subjects. This reframing facilitates recognition of the highly contingent nature of popular culture and a public's appetite for it, as well as the cascading effects felt throughout the instrument trade when a change is experienced in one of its component parts (which, again, is also an assemblage). Similarly, the assemblage can be used to consider the (de)formation of musical genres, as in the case presented in chapter four concerning the tentative link drawn between rock and the classical avant-garde under the banner of "electronic music" in the late 1960s.

Finally, to return to the example with which I began this afterword, how should we consider rare instruments like the Tubon, which lack both close generic affiliations and deeply

entrenched patterns of use? Put another way, of what assemblages are such instruments a component part, and what kinds of capacities might they facilitate exercising in those contexts? Though a fully formulated answer to these questions is beyond the scope of this work, it is worth pausing for a moment to consider why this particular body of instrument technologies from the sixties must necessarily elude a project whose temporal bounds are precisely 1960-1969. As I've suggested, a productive preliminary inquiry might begin online. The internet has afforded these instruments an environment in which their individual rarity—their absence from history, their failure to be properly amalgamated into any generic assemblages of the period—can be experienced collectively as a recognizable phenomenon with newfound relevance for the present. Indeed, it is their shared strangeness that draws them together again in new rituals of nostalgia, novelty, and connoisseurship that have been amplified by the global reach of platforms like YouTube. Scholars have long recognized the potential of the internet to shape musical cultures and communities in novel ways, especially with respect to genres, technologies, and practices that postdate global connectivity.[15] But as the digital archive has continued to swell, artifacts of the pre-digital era have been impacted as well. Thus, musicologists and historians have much to gain from careful consideration of the ways in which information about their subjects is disseminated and consumed by the world at large in our present epoch.

Taken together, the videos that I've discussed here depict a new phase in the social lives of these instruments, one that is both anachronistic and markedly contemporary at the same time. Or, perhaps more accurately, the flow of these instruments' social lives has become entirely

[15] See, for example, René T. A. Lysloff, "Musical Life in Softcity: An Internet Ethnography," in *Music and Technoculture*, ed. René T. A Lysloff and Leslie C. Gay, 23-63 (Middletown, CT: Wesleyan University Press, 2003); Andy Bennett and Richard A. Peterson, *Music Scenes: Local, Translocal, and Virtual* (Nashville, Vanderbilt University Press, 2004); and Michael D. Ayers, ed., *Cybersounds: Essays on Virtual Music Culture* (New York: Peter Lang, 2006).

suspended as they have transcended their physical forms. Though hardly remembered for the music that was made with them, these on-screen representations proffer only a small snapshot of the affordances offered up by these instruments. For the vast majority of us who have never experienced an instrument like the Tubon without digital mediation, those twelve jaunty bars may comprise all that we have, and will ever have, to know of it. Put another way, the instrument displayed in the video, and described in the comments, is not really the instrument "itself." Like Roland Barthes' distinction between the technological, iconic, and verbal structures of fashion, the experience of these video-instruments is governed by wholly different logics than that of a physical instrument in the act of performance.[16] As such, they constitute a radical departure from the more common and readily available instruments that one is equally likely to encounter both online and off. Perhaps the closest analog in terms of videographic style are the many review, demonstration, and "unboxing" videos on YouTube and other online video platforms showcasing the features and stoking the allure of purchasable music gear. But while the sheer inaccessibility of these old instruments defies the logic of commerce, these video-instruments nonetheless work to foster a sense of desire for and affiliation with the technology itself, rather than the music that has resulted from its use. Indeed, perhaps that dearth of music is the source of much of their charm. Unburdened by their failure to take hold, they enter the present with their best performances still to be played. Or, perhaps better, only to be dreamed about.

[16] Roland Barthes, *The Fashion System* (Berkeley: University of California Press, 1990), 10.

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