# THE COMPUTERIZATION OF PRACTICE IN PERIPHERAL MUSIC COMMUNITIES

by

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# Abstract

The widespread adoption of the desktop computer in the production of popular music has the potential to change the way independent music is made and understood. On first glance, it would appear that the decreasing cost of home computers, and the free exchange of software based recording technologies promises to decentralize music making in a significant way - as much as (or more so than) was the case with the advent of inexpensive multitrack cassette recorders during the 1970s and 80s. So the argument goes: a reduction in barriers to entry to recording and distributing music widens the field of producers.

It may be true that because of its low cost, desktop computer-based audio production opens up access to high-quality techniques of recording to a greater number of musicians than ever before. It is equally arguable that the current restructuring of mainstream, corporate networks of musical exchange (as a result of widespread adoption of other, related computer technologies such as MP3 and peer-to-peer file sharing protocols) is partially leveling the playing field between independent and corporate music producers. Recent computer technologies appear to bring blessings and opportunities to independent musicians.

But can this new technological assemblage bring about a meaningful decentralization of music making? Obviously, the dissemination of specific technologies, alone, does not constitute nor bring about social change. To profess this is to commit the fallacy of technological determinism. An attempt to provide at least a partial answer to this question calls for two research initiatives: (1) a political economy approach to the study of music production (with an eye toward analogous technological changes in the history of popular music), and (2) a qualitative investigation into contemporary musical practice.

# Acknowledgments

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## Chapter One: Introduction

With this thesis, I undertake two research initiatives: (1) a political economy of music production, with an emphasis on technological changes in popular music's history, and (2) a qualitative study of contemporary musical practice.

For the first of these initiatives (from whence flows the second), I have framed my primary research questions in the following manner. Independent musicians work on the periphery of two structurally related commercial systems: the global commercial music industry (divided into regimes of production and distribution), and the industries involved in the sale and marketing of recording technologies. Conventionally, these industries function in markedly dissimilar ways, although the goals of the companies involved in either industrial grouping are often consistent. Both industrial systems rely on independent musicians as a crucial resource (respectively, as "talent pool", or as technology consumers). Musicians' involvement in both industrial systems may be characterized in terms of core-periphery relations, as may be observed in the industries' current material structures.

The primary division between core and periphery in the music industry is determined by historical developments in the structure of global music distribution. For various reasons, the financial success of companies in the contemporary popular music industry is dependent on their control of distribution channels (music retail networks, manufacturing and distribution infrastructure, and broadcast media). For several decades, a handful of large companies (the core) have maintained significant control of these nodes of the industrial regime (through direct ownership, through horizontal and vertical integration, and through access to a large base of marketing capital used to exploit the

revenue potential of a small number of privileged artists). The periphery – smaller scale in industrial terms, but far larger in terms of the number of participants (musicians) involved in the production process – consists of a dispersed network of localized enclaves of independent musicians, small record companies, and independent distributors and retailers. Insofar as their access to large scale distribution networks is limited, companies and musicians on the periphery adopt strategies of either cooperation or resistance to the predominance of core regimes of music production and distribution.

The relations of the periphery to the core are manifest in the constitution of music production networks, which rely on a "flexibilized" structural regime. The flexibility of this regime is manifest in the licensing and distribution agreements between large "core stream" companies and independents, and the "outsourcing" of production duties to "independent" producers. While some small record labels manage to forge lucrative contracts with companies in the music industry's "core", these arrangements typically involve the small companies acting as independent A&R firms or "talent farms", and a relinquishing of authority to distribute the music they "develop". While it may appear that such arrangements are exemplary of a decentralized production regime, this "flexibilization" of production may actually work to reinforce the structural hegemony of a few large music companies, in that entering into such relationships systemically reinforces the preeminence of large scale distribution networks.

The other commercial system that has conventionally had the effect of marginalizing the majority of popular musicians is the recording technologies industry. Historically, cost prohibitions have acted as a significant barrier to entry into music recording (distinguishing a "core" and a "periphery" of professional and independent

musicians). Conventional methods of music recording (in commercial studios with expensive equipment and trained personnel) involve the positioning of musicians as consumers in a capital-intensive economy of practice, where required funding is scarce, guarded by gatekeepers of an oligopolistic music industry. The advent of MIDI and the multitrack cassette tape recorder in the 1980s played a significant role in the growth of peripheral music making during that era, in that cost prohibitions were lowered, and in that the cassette tape compacted the media of production (formerly, reels of tape) and the prevailing media of distribution (formerly, vinyl records) into a small, inexpensive package. The emergence of the Compact Disc as the primary medium of musical exchange had the effect of reconsolidating the technology industry's control over distributional media.

The coincident development of the home computing industry has, piece by piece, eliminated barriers to the production and distribution of music. The market price of CD authoring devices has plummeted over the past decade, originally in response to the increased demand for convenient data storage in both business and home computing scenarios. The unintended spinoff effects of this development have included a decline in costs of the reproduction of music CDs (leading to widespread CDR piracy, notably in Third World countries), and growth in software piracy. The growth of the Internet as a distribution medium for music and software is an even more destabilizing trend for both the music and software industries. The rate at which MP3 files may be exchanged freely over long distances is alarming to companies at the music industry's core, as this user-driven distribution system bypasses their conventional distribution infrastructure.

But MP3 files are not the only technology that is being freely shared. The most

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recent major development in musical technologies is multitrack audio recording software, which is also freely (and illegally) exchanged online. For those who are so inclined (or forced to do so by economic necessity), music software eliminates the high costs of recording studios and hired sound engineers. Independent musicians are capable of producing recordings comparable in sound quality to those produced by core stream music companies. Combined with the distribution potential of the internet, software based recording technologies enable musicians on the periphery to record, distribute and market their music on a scale that independent musicians of twenty years ago would scarcely have imagined. Arguably, there is less need for independent musicians to seek remuneration for their creative efforts, because the costs of production have been lowered so significantly. Hence, the relationship of the musical periphery to the musical core has the potential to transform dramatically at this juncture.

The adoption of home computers in music production also has an ideological component, and the attitudes and values associated with computerized recording may have far-reaching social implications as well. No matter what tools musicians use to make recordings of their work, they are positioned as consumers in the exchange of particular technologies – technologies with marketing and design characteristics that may influence use patterns, and in turn, the social relations of music practice. By investing in a computer, associated audio interface hardware, and the long hours spent learning how to effectively use digital recording software, musicians are now immersing themselves in a new technical environment, and a culture of consumption around which a small number of corporations (computer software and hardware developers) are positioning themselves. While digital musicians are free from many of the financial pressures of conventional

music making, their immersion into a new set of products and techniques makes significant technical and social demands on them.

Computers are thought to offer a degree of aesthetic freedom and control not possible with former recording tools. This idea may work to further rationalize the music making process into something rather un-musical. The modality of interface between human and computer is markedly different from former configurations of musicians and audio technologies; along with this changed mode of interaction comes a demand for different skills and technique, and an encounter with new technical limitations. The ergonomics of computer design may limit opportunities for face-to-face collaboration between musicians, potentially fragmenting and alienating former production processes in popular music. Music software may work to rewrite the codes of music making. I am curious as to whether this has troubling implications for the internal organization of bands (or groups who otherwise regularly collaborate to make music).

Musicians are "profiled" as "consumers" by software and hardware manufacturers, centering around a rhetoric of technological utopianism, rationalized control, and individual self-actualization. While music making is less expensive than it used to be, musicians may be as receptive as ever to the marketing strategies of the companies who sell new products to them. Digital audio production technologies are brought to market with a number of assumptions about who the consumer is, and what s/he will do with them; the design of hardware and software interfaces and tools reflects a company's (descriptive) perception of the user, and also establishes (prescriptive) parameters within which the user may create music. This second point is crucial in studies of production in popular culture; as such, a 'top-down' relationship between the

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high-tech firm and the musician-consumer might lead to a homogenization of technique (and, by extension, a homogenization of aesthetic goals and preferences) across a diverse population of musicians. Also, the software industry appears to be profiling musician consumers into "amateur" and "professional" markets – which may reinforce, or even amplify, existing status divisions in musical communities.

The expanding role of computers in both recording techniques *and distribution networks* may herald a more complex ideological problem – one with, perhaps, negative social consequences. Computers are thought to liberate musicians from their prior "lockout" exclusion from the mainstream music industry, bearing a promise that musicians may develop independent, direct, web-mediated networks of both creativity and exchange. But the adoption of home computers for recording is part of a broader trend in which computer technologies are seen reaching into a wider range of activities than ever before (not only the production of music, but its distribution and publicity, and many other auxiliary activities related to music making, such as graphic design and word processing). Conventionally, independent music communities are mediated, reinforced, and reproduced through a number of different media, involving a typically tight-knit group of actors working (most often voluntarily) in small scale institutions: localized music press, campus radio stations, independent record labels, independent booking agencies and promoters, small venues, and independent record stores. And, independent music distributors, conventionally, play a significant role in linking these localized music production scenes together in rather loosely formed regional, national, and international networks of distribution and consumption.

Local musician communities are, in many ways, enhanced by the use of new media. Chat rooms, message boards, websites, and email are all extremely useful (and now widely used) in reinforcing local music communities: announcing or organizing performances, and passing criticism back and forth, among other applications. Arguably, fan culture centering around local music may be also stimulated by the use of these media. These media also promise the digitized extension of independent musical networks beyond the local scale. Many musicians develop extensive networks with other like-minded musicians and audiences around the world prior to (or in place of) establishing local contacts and fans, without the aid of conventional distribution. For some musicians, this is an increasingly effective way to find an audience and a musical community.

For some, more and more of the activities of music production, distribution and consumption are taking place exclusively in the virtual domain. We may be seeing the emergence of a class of musicians whose musical activities are entirely conceived, mediated, and received in the isolation of a personal plastic box. Some musicians profess to value working alone over participation in a musical community, seemingly echoing the individuation and automation made possible through computer use in a range of activities. This is not to say that computerization *causes* the fragmentation of music scenes. But the survival of peripheral music communities may depend on mutually supportive relationships, which in turn depends on awareness of the value of (and ideological commitment to) the notion of the "local musical community". If computerization facilitates an environment of increased self-reliance and isolationism in practice, might this, in some small way, contribute to the dissolution of localized music

communities? Perhaps musical collaboration and community will manifest in new ways, over broadband connections and very long distances. Perhaps, indeed, music communities will not change, but will merely be mediated through new tools. To be sure, many musicians hold dearly to the idea that music is an inherently social activity. For these musicians, the idea that technologies can replace face-to-face interaction in spaces of collaboration and community support is laughable. But just as surely, an increasing number of musicians are building musical lives without face-to-face collaborators, and without a localized community of support. The relationship of computerization to these divergent values among independent musicians is at the heart of the present inquiry.

The social challenges presented by a widespread computerization of musical practice are several. The widespread adoption of computers in almost every facet of music production, distribution and consumption threatens to disrupt not only the machinations of mainstream, commercial music networks, but also the close social relationships of independent networks. Independent musical networks have existed outside the mainstream music industry for some time, despite historical barriers to entry into production. These networks, too, may feel the effects of "technological disintermediation". It also appears that adoption of computer technologies in music is rather unevenly "widespread". Adoption choices may be based on gender, familiarity with computers, and, partially, on preferred music genre. Hence, music communities can fragment in multifarious ways. As I will explain later, maintaining healthy social relations around practice, and maintaining localized musical communities, are both essential to the viability and democratic character of music made outside the mainstream, commercial industry.

In the light of the growing dominance of corporate media on the Internet, the flexibilization (or fragmentation) of peripheral music scenes may work to further reinforce the structural hegemony of the core music stream. More and more, musical practice undergoes the same process of transformation as other forms of labour in the "flexibilization" of practice and the "diffusing of the factory" – with musicians increasingly bearing resemblance to Negri's "socialized worker" (1989): seduced by the cybernetic command of software and electronic networks, and abandoning the "factory" – the studio, the rehearsal space, the record store, and the live venue - for the (often domestically situated) computer terminal. Confounding this question is the ambiguous status of musical "work", especially in independent or "amateur" music scenes: when is music appropriately called "work", and when is it merely "play", "hobby", or "recreation"? Again, drawing on Negri, the blurring of waged and non-waged time, relocated in the domestic sphere, may degrade the notion of "music-as-work" as it is commonly understood. In the Canadian context, this socialization of musical work, along with the reduction in production costs it brings, may work to justify decreasing government funding for the independent music sector.

The ideological assumptions underlying the dissemination and marketing of computerized music technology (technological utopianism, individual self-actualization) may work against the grain of extant values shared by many independent musicians. Valorizing the artificial "revolutionary" promises of computer technologies such as MP3 and recording software applications may distract musicians from the importance of working for enduring structural changes that ensure the survival of music on the periphery. This has implications for both public policy and the maintenance of local

institutions and public spaces for independent music performance, rehearsal, recording and critique.

In an effort to begin this process of questioning, I carry out the second of my research initiatives through a qualitative study of musicians and sound engineers in Vancouver, Canada. The primary data sets in this study are (1) interviews with musicians and sound engineers in regard to their personal histories in musical technologies and musical communities, combined with (2) observation of their activities in computerized recording environments. Throughout data collection, I have queried how the adoption of computers in audio production (and more widely, the adoption of a broader computerized technological assemblage in activities associated with music) is related to access, conditions of musical work, and perceptions of community and "music-as-work" among musicians and sound engineers. Embedded in these questions is the idea that individual values about community and musical practice influence the social dynamics of music communities. I am curious as to whether the computerization of musical practice indeed brings with it values like technological utopianism, valorization of individual self-actualization, or increased rationalization of creative practice (as some have argued previously - notably Théberge, 1997). I am also curious about musicians' valorization of the idea of solidary "communities", an idea upon which peripheral music communities may depend for their survival. By querying not only their case histories in music and technology, but also musicians' attitudes and values toward musical technologies and communities, participants in this study can give some indication of what the future of music production might look like, in both social and technical terms.

I begin this thesis with a political economic overview of music production and distribution networks (Chapter Two), wherein I define and discuss the "core" and "periphery" of the music industry (Section 2.2), the ways in which the musical periphery is seen to resist or co-operate with the core (Section 2.3), the ways in which public policies attempt to intervene in the structural problems of the music industry (Section 2.4), and the ways in which music distribution is undergoing a "technological disintermediation" (Section 2.5). In Chapter Three I describe another sort of network – that of "productive consumption" – in which musicians are positioned as consumers of instruments and recording technologies. First, this is discussed in terms of the influence of multitrack recording, MIDI, and other music technologies (3.1). I then go on to discuss the way in which computer software and hardware industries construct musicians as consumers (Section 3.2). Finally, I consider the implications for change in musical practice, in light of the currently pronounced engagement of music and computer technology (Section 3.3).

The empirical section of this paper centers around my six months of immersion in the local independent music scene in Vancouver. It begins with a description of my methodology (Chapter Four), including interviews with musicians and sound engineers (4.3), observation of band interactions in a studio facility (4.4), and six months of participant observation in an independent band (4.5). Chapter Five is a summary and analysis of observations and data culled from interviews. To conclude this study, Chapter Six contains a wider consideration of issues arising in the field data in terms of the political economy of independent music production provided at the outset. Here I offer some prognosis for the future study of independent music, in terms of musicians'

attitudes toward technology, their composition practices, and their involvement in

independent networks of production.

<u>Chapter Two: The Production of Popular Musics</u>

Music production networks cannot be analyzed in isolation from the wider networks of exchange (distribution and consumption) that influence their structure and dynamics. The following is a political economic situation of the two primary networks of concern in this study - production and productive consumption – in the context of this wider social and industrial framework.

## 2.1. Theoretical Problems: Core-Periphery, Structure-Agency, and Moving Targets

In developing a political economy of popular (and unpopular) music, I mean to differentiate two coexisting types of exchange streams in the North American popular music industry. Commonly, though often inaccurately, these two streams are referred to as "independent" and "major" streams. For this thesis, I prefer the terms "core" and "periphery", because of reasons I explain below.

Following Straw (1996), I argue in this paper that historically, the music industry in Canada is a two-tiered structure, with a sharp, uneven distribution of capital and labour into a core and a periphery. Both the industrial *networks* and the *individuals* working in them may be described as core or peripheral by virtue of their relation to power and capital within the music industry. The first dimension (of networks, of groups, of communities, and of values and ideologies) along which I differentiate core and periphery invokes structure; the second dimension (of individuals, of actions) invokes agency. In weighing structure and agency evenly in this analysis, I aim to avoid the trinity of pitfalls of so much analysis of technology and culture: (1) technological determinism, (2) technophilic utopianism, and (3) generalized structural determinism (in

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this instance, the perception of determinism on behalf of the core stream of the music industry). However, achieving this balance is a theoretical challenge in respect of the various readings of core-periphery relations that predate this study.

Core-periphery as an organizing concept, of course, is nothing new to communications studies. In *The Bias of Communication*, Harold Innis (1951) describes core-periphery relations as they play out in the historical development of communication media. His thesis is that different media technologies have different social potentials, though they are not determinant of social or economic outcomes. According to Innis, communication media may have bias toward either space (such as paper - perishable, but lightweight, easily disseminated widely) or time (such as stone tablets, which have temporal durability and are not easily moved). Innis argues that speech is also a time-biased medium, as its use depends on a stable community locale for face to face interaction. While spatially biased media are conducive to imperial expansion, temporally biased media are most conducive to the establishment of social hierarchies. In this sense, the bias of communication technologies affects their potential use by marginal groups to resist hegemony.

In narrating this history, Innis describes how different media influence the relationship between core and peripheral cultures or groups. The classic example of this is the spread of secular, vernacular writing on paper, whose mobility and reproducibility destabilized the Catholic Church's central monopoly on knowledge, held through its concomitant monopolies on both parchment and, by extension, Latin. Empires (including media empires) usually attempt to monopolize knowledge spatially (through conquest and expansion) and temporally (through the establishment and maintenance of social

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hierarchies).

Following Innis' approach, one may observe significant potential for the musical periphery to use new media technologies to undermine knowledge monopolies at the core. However, the nature of new media calls into serious question the relevance of spatial or temporal bias. Conventionally, the core of the popular music industry controls space through their oligopoly on distribution networks. They also control time through the flexibilization of local music production communities, and by establishing, through broadcast media, an ideological state of "hopeful contingency" for musicians (communicating, again and again, the message that social mobility in the music industry is possible, and desirable).

Emergent practices such as software piracy and peer-to-peer file sharing take advantage of the 'hyper-reproducibility' of new media (CDR copying, high speed internet connections, and the availability of high capacity hard drives), to the point where the conventional core of the music and recording industries can no longer use their prior dominance of space (globalized, nonrecordable media distribution networks) or time (localized, flexibilized production regimes). With the help of online user forums devoted to software recording, the recording industry's former monopoly on knowledge about audio processing is also threatened. The institutions and social hierarchies associated with prior media (recording studios, sound engineers, independent producers, tape machines, and record or CD manufacturing plants) are potentially disrupted by the "virtually" biased networks of peer-to-peer software and MP3 exchange. The use of online media by musicians on the margin threatens the global music industry's monopolization of both music distribution networks, and production techniques and knowledge.

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Offering a somewhat different account of "core-periphery" (absent the bias of space or time) Wallerstein (1974) describes a global economic system consisting of a core (highly urbanized, industrialized, and capitalized, the center of decision making power) and a periphery (where resources are discovered and exploited, and wherein individuals are, more often than not, mere suppliers to the core, lacking control of the economic system) (Friedman 1994). A core usually develops in a region that has an initial comparative advantage, perhaps because of its resource base or its location with respect to international markets. In this instance (musical economies of the early twenty-first century), the comparative advantage of the core is its unrivalled access to global distribution networks and capital. This initial advantage is maintained through cumulative causation and agglomeration economics (Friedman 1994).

Economic core-periphery theories such as Wallerstein's observe as a predominant pattern the migration of labour from the periphery to the core. When the periphery loses its labour force to the core, it becomes a region of dependency (Friedman 1994). The relationship is echoed in the musical economy by (1) the licensing of independent labels and artists to core stream distribution companies, and (2) the movement of (mainly voluntary, unpaid) personnel from independent music communities to paid positions in major labels, national broadcasting companies, and promotion companies. While some argue that a trickle-down of wealth from the core to the periphery supports the development of the periphery, dependency theorists argue that the creation and disenfranchisement of peripheries is the direct result of creation or strengthening of cores (Evans 1985). If a "backwash" of labour migration towards the core dominates, then the relationship between core and periphery remains unstable, and unequal. The economic

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disparity between the two regions is intensified.

Peripheral music production is indeed a hinterland of "resource extraction" for the core. Companies and individuals of the periphery adopt strategies to either co-operate with or resist the material conditions imposed by dominant companies at the music industry's core. Resistance is often futile, and rarely "successful" in the financial sense of the word (though there are other meanings to "success" among peripheral musicians and independent record companies). Co-operation usually involves a re-structuring of the internal organization and mandate of a peripheral company, so that it fulfills a specific need (such as A&R, or Artists and Repertoire) demanded by companies occupying the core. Co-operation between core and peripheral companies and individuals is made possible when production networks have what is sometimes called "flexible structure".

But musical cores and peripheries have unique characteristics. Firstly, musical core and peripheries tend to partially coincide geographically. In music production networks, which tend to be concentrated in large urban centers, core and peripheral musicians and associated cultural workers often utilize the same facilities and some of the same institutions.

As well, musicians on the periphery are receptive to the dreams of commercial success that are continually communicated through mainstream media. Many peripheral musicians possess a desire to earn significant remuneration from their music. The chances of actually achieving this are statistically negligible, as mainstream music companies, restricted by an unpredictable, fickle market for music sales, are reluctant to sign, license, or promote musicians or bands who have not already proven themselves capable of selling tens of thousands of copies of their recordings.

Still, the latent promise of 'overnight success' pervades the pages of high profile music magazines and music television channels, ostensibly used to increase the sales of numerous well-known artists, but also reinforcing the "hopefulness" of the periphery in its desire to migrate to the core. *Rolling Stone, Spin, New Musical Express*, and numerous other well-known publications (involved in structural relationships to the core recording industry) are full of stories of artists 'discovered by talent scouts' or 'finally signed to BMG after years of toiling in indie obscurity', eventually obtaining multimillion dollar record contracts, which in turn, launch their international careers; the story is roughly the same, all the way from Nirvana to The Strokes. This mythic teleologism – movement from periphery to core, from rags to riches, or, in the covetous cachet of indie music pessimism, "selling out" - has become a journalistic industry in and of itself.

This situation makes theorizing the "independent" (and its opposite) in music an extremely tricky business, as the traditional terminologies of popular music scholarship and press ("major" and "independent", "mainstream" and "alternative") cough up connotations that are both mythological and inappropriate. As Coyle and Dolan (1999) argue, terms like "independent" or "alternative" are too often subsumed in the marketing of popular music as invocations of (false) authenticity; in this idiom, almost anything "mainstream" or "major" may also be "alternative" or "independent". The ambivalence of core and periphery within this endless dialogue about musical "success" demeans the notion of the local or peripheral. If a consumer's desire for "cutting edge", "independent" music is serviceable through core stream media, or if social mobility between core and periphery is highly flexible, then the usefulness of a local, peripheral music community is seriously called into question.

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As such, the survival of music on the periphery is dependent on not only a technological bias, but on an ideological bias at the level of local musical communities. Resistance to the core music industry's monopolies of knowledge depends on not only using the media they cannot control, but discarding their myths as well. In this context, core and periphery are not adequately accounted for by a summary glance at technological change in music production. Rather, social changes in music production are dependent on the values and attitudes of musicians working in them.

The second (individual) instance in which core-periphery relations are inscribed in music communities refers to the work of Levidow (1990), Negri (1989) Caffentzis (1992), and Dyer-Witherford (1999). These authors, most of them autonomist Marxists, describe the economy of "cybernetic command" labour, in which the work force is diffused from a centralized physical location of mass work (the factory, or, in the present instance, the recording studio) toward isolated work environments (in the present instance, the domestically confined computer terminal). According to these authors, computerization and automation in other labour spheres (office environments, education, among numerous others) has accompanied a division of the labour force into pools of well-paid, full time, skilled labour and underpaid, part-time, deskilled labour) (Levidow 1990). The seductive potential of the home computer as a "music career workstation" or "digital lifestyle hub" (at which most of the tasks involved in production, promotion, distribution, as well as consumption of music can take place) may have the tendency to lure musicians into retreat from localized physical spaces of shared musical life – spaces that once were conducive to developing solidarity and resistance to the hegemony of not only the music industry, but other sources of hegemony as well.

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This "decentralization" of music production relies on technological developments that permit a wider number of participants. Through the use of other media such as online forums, a widening number of technology-reliant participants can rapidly learn skills that sound engineers conventionally spend thousands of dollars on learning in trade schools. This potentially de-values the skills of the engineering labour pool, which is increasingly bifurcated into "professional" and "semi-professional/amateur" divisions. This bifurcation can be reinforced through the diffusion of technologies such as recording software, which inscribes difference along price points.

Using both of these frameworks - Innis, Wallerstein, and others on the one hand, and the autonomists on the other – reveals the problematic of structure and agency in the analysis of the musical core-periphery question. As well, this orientation presents further problems of identifying core and periphery, especially in light of the fact that the subject is a "moving target", currently undergoing transformation as I write.

In most parts of the world, there are, additionally, cultural markers (language, ethnicity, and musical style) that clearly distinguish the activities of core and peripheral streams of music (Chambers 1994). These distinctions exist, too, in some North American urban centers, as is the case with peripheral exchange streams of hip hop and salsa in U.S. urban centres (Negus 1999).

But some peripheral networks are solely marked by their capital disenfranchisement, and their near-invisibility in mainstream media. Indeed, peripheral networks of all kinds are often theorized as "feeders", or "talent farms" for the core music industry (Frith 1981), largely because (1) the music produced in them is widely viewed as aesthetically assimilable into the core music industry, and (2) though there are exceptions

(which I discuss in Section 2.3), many peripheral music production companies actually do function as "talent farms" for the core.

In recognition of all of the above problems with theorizing core-periphery and structure-agency when faced with a subject that is possibly under radical transformation (and in recognition of the fact that some "peripheries" are less visible than others), I have erred on the side of economic reductivism. I distinguish "core" and "peripheral" streams of musical exchange according to four criteria: scope of global extension, economy of scale, access to capital, and visibility in mainstream media.

## 2.2. The Political Economies of Music: Core and Peripheral Streams

Peripheral musical streams - typically small, for the most part localized, and marginally profitable (if at all) - traditionally consist of the following: independent musicians, their fans, small venues that host live performances, independent (often home-based) recording studios, independent record labels, small independent distributors, campus and community-based radio stations, and independent record stores. I define the "core" stream of musical exchange as that ubiquitous cluster of large, global-scale music companies (the "Big Four"), including Sony, Vivendi Universal, Warner-EMI (a division of the AOL/Time-Warner empire) and BMG (a division of publishing giant Bertelsmann) – along with their globally extended distribution networks, and their affiliates in promotions industries and broadcast networks (to which these record companies maintain near-exclusive access).

Both core and peripheral networks of exchange can be further subdivided into three broad activity domains or networks: production, distribution, and consumption. In

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peripheral (or "independent") music networks, the activity domains (production, distribution and consumption) are much more interpenetrative than is the case in the global stream. Peripheral music streams tend to be localized in scale, with a more extensive overlap of labour (individuals simultaneously working in more than one domain), and close occupational relationships. While peripheral distribution networks are often international, they tend to consist of individuals who, though far flung geographically, share an intense dedication to preserving alternative channels of music exchange; replacing the valuation of profit with the valuation of the alternative network binds these individuals and companies together in a way that resembles a "community" more so than is the case with their occupational kin in the core industry.

Individuals involved in such small-scale economies as peripheral music communities are more likely to be less specialized, having to distribute their time and energies to activities as wide ranging as graphic design, postering, recording techniques, community or campus radio programming, on-air speaking, musical performance, web design, retailing, event organizing, and grant writing. In industrial economies of scale, tasks are divided up between companies and individuals based on the different processual stages in the global-scale exchange of musical commodities (Negus 1999). As a result, established, large scale industrial organizations are extremely vulnerable to the negative effects of technological changes that affect their commodities at any point in the production chain, as a more rigid specialization of labour weakens the flexibility of the system. Smaller, independent communities made up of individuals who continually change vocational hats may be less susceptible to these negative effects, seeing that by (industrial) design, they are forced to become 'Jacks (and Jills) of all trades'.

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Companies tied to musical economies of scale (again, divided into comparatively discrete divisions, or networks, of activity) are organized in a few different ways, according to their position in the industrial process. As Hesmondhalgh (1996) describes, companies involved in cultural production tend to be relatively flexibly organized, delegating much creative work to a number of outside contractors (independent producers, independent recording facilities, and smaller record labels acting as recruiters of new artists). While some theorists (Christopherson and Storper 1986) argue that this "flexible structure" of production divisions in culture industries is indicative of a general trend toward "post-industrial" economic structure, and a "decentralization" of power, accounts such as theirs fail to acknowledge both the preeminent power and vertical integration of distribution, exhibition, and retail sectors in cultural industries (Aksoy and Robins 1992). Hesmondhalgh argues that despite flexible organization in music production, market fragmentation, and the independence of A&R decision-making, the mass sales of dominant forms of expression are still the mainstay of the mainstream (core) music industry (1996:484). It is to a close analysis the relationship between core and periphery that I now turn, in my discussion of the contested nature of "flexibilization" in cultural production networks.

## 2.3. Networks of Production: "Music Scenes", Flexibility and Decentralization

There has been much debate about the "decentralization" or "flexibilization" of core-stream music production in the past few decades. Despite well-known examples of corporate mergers in this area in the past few years (the merger of Warner, Time and AOL, the merger of Warner and EMI, the merger of Universal and the utility-rich

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Vivendi, and innumerable acquisitions of independent record labels by the majors), the production process, it is argued, has experienced something of a decentralization in the core music stream. This has led to an inordinate amount of speculative trumpeting of the potential for "local music scenes" (classic examples being Seattle and Halifax, among others) to explode from time to time, infusing the core of the music industry with a flood of "innovative" artists and bands, which have the potential to transform the political economy of popular music.

Scott (1999) and Leyshon (2001) interpret the network of production under the rubrics of "creative field" and "music scene". They observe the spatial agglomeration of creative networks, whose sustenance depends

> on a set of stabilizing institutions, such as performance venues, specialized
> record shops, rehearsal and recording studios, specialized music press, and
> record labels. These institutions facilitate the circulation of, and
> interactions between, artists, specialized labour, dedicated institutions,
> and, significantly, audiences, which facilitate the combination of skills and
> technologies to create new musical forms" (Leyshon 2001:62).

Shank (1994) defines a musical scene as "an over productive signifying community [wherein] far more semiotic information is produced than can be rationally parsed" (122), implying that this information has nowhere to go but outside the local context. Others have pointed out the significance of how "music scenes" are centres of not only production, but also interpretation (Thrift 1994) - which mediates their growth or visibility in mainstream media. Hennion (1989) argues that the process of record production involves "progressive attempts to extend what has first been localized in the studio" (402). This is achieved through a series of negotiations with audiences - "a circle of actual auditors that is gradually widened" (416) as music moves through the chain of exchange between producers and consumers. According to Scott, "these pools or

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communities of workers are also the preserve of accumulated traditions and conventionalized sensibilities (including cultural norms as embodied, for example, in particular musical genres), and they function as potent frameworks of cultural reproduction and arenas of socialization" (1999:1974-5).

I think these authors accurately describe some of the dynamics of musical production networks. What these authors fail to account for, however, is a multidimensional analysis of creative production streams – in terms of both (1) the relationship of core and peripheral streams within particular music production networks, and (2) music communities' reception of myths about musical mobility from periphery to core. At the expense of the explanatory power of their arguments, they exclusively refer to the core stream and ignore peripheral streams of music. They also characterize core streams as localized, when in fact they are predominantly globally extended. I have (graciously) read their arguments narrowly, assuming that by "local scenes" they mean to refer to the large "localized" centers of the core stream of the music industry (New York, Los Angeles, London, Nashville). These are, of course, cosmopolitan centers of industry, finance, and culture, which for various reasons (which I will skip over here for the sake of brevity) attract large multinational music companies. In this paper, I use "local scene" to refer to the local activities and institutions of peripheral production networks. As I have already stated, peripheral stream production networks tend to be locally-bound, while core stream networks are globally extended. They may co-exist in the same physical environs, but their degree of extra-local reach is drastically different.

The concept of "flexible organization", a critical meme in post-Fordist theory, is similarly problematic. It assumes one (core) stream of production that is variously

flexible or inflexible in terms of whom is permitted entry as a producer. My use of "flexible organization" in this analysis refers to the flexibility of a core stream of musical production. The degree to which a core stream network is flexible, then, is the degree to which it permits entry of artists and other labourers from peripheral networks. "Flexible organization" does not apply in the same way to peripheral networks because, by their very definition (marginally profitable, localized, and informal), entry to participation is wide open; they are almost by definition "flexible"[1].

It is arguable that the more "flexibly organized" a core stream creative production network is, the more vulnerable it is to fragmentation. That is, a flexibly organized production community would by definition pose fewer barriers to entry than one that is not so flexibly organized. The relationships of local independent actors (unpaid musicians and independent record labels – the "peripheral" breed) with companies and institutions associated with the core global music industry may be variously characterized as resistive or co-operative. When peripheral production networks resist, they seek out their own methods of distribution, and their own ways of reaching audiences. When they are co-operative with the core stream, they typically take on various licensing and distribution arrangements with larger companies (acting more like management or A&R companies) or are subsumed through buy-outs (Hesmondhalgh 1998). Considering networks of production in terms of these two streams appropriately magnifies the importance of producers' relations with distributors and consumers – in essence, the prevailing political economic structure with which actors and companies in networks of production must contend.

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[1] The relative "flexibility" of peripheral music production networks may actually be contested ground (Hesmondhalgh 1998). In the interest of brevity and focus I have not explored this problem here.

The market for recorded music has always been quite volatile. Profits from the sale of recorded music are traditionally exploited through (1) sales of media such as vinyl records, cassette tapes, and compact discs, and (2) licensing performance rights to radio and television broadcasters. In the1980s, large record companies came to dominate music distribution and broadcast. To achieve this, they began to act as distributors of their own music, rather than relying on independent distributors, as they had done so formerly (Burnett 1996:61). To dominate the television and radio airwaves they strengthened vertical alliances with radio and television programmers, through the services of independent promotion companies, and in many cases, payola (Jones 2002: 217).

In their efforts to control both physical distribution and broadcast networks, the re-structuring and concentration of the core essentially constructed a periphery of independent companies and artists, whose access to the loci of revenue generation (broadcast royalties and retail sales) was drastically reduced. Adapting to this situation involved (and still involves) smaller record labels forging links with larger companies (Negus 1992). Small record labels provide their larger partners preferential access to their roster of artists in exchange for access to the larger company's stable, efficient reproduction and distribution networks (Leyshon 2001: 63-64). Through these agreements, informal, but binding relationships between the peripheral and core stream companies result. In this market environment, small record labels increasingly take on the role of a "talent farm", an independent A& R company, or an artist management company.

The significance of the determining power of distribution networks in the Anglo-American popular music industry is one that is very difficult to overstate. While the

relationship of core and peripheral production networks may be characterized as "flexible" or "inflexible", their relationship is always structured by the core's traditional stranglehold-like dominance of distribution. Instructive of this relationship is a comparison of two distinct historical cases of peripheral record companies: Nettwerk (Canada), and Rough Trade (U.K.). Each of these cases exemplifies a different articulation of the relationship between the core and periphery in pop music production.

## Nettwerk Productions

The history of Nettwerk Productions in Vancouver is exemplary of co-operation of the periphery with the core (and the periphery's assimilation by the core). Beginning the early 1980s, Nettwerk Productions evolved from a small indie label to an international talent and management company in just over a decade. It was initially established in order to release and promote the recorded output of a handful of local bands (Moev, Skinny Puppy, Images in Vogue) and a few lesser known international artists (Chris and Cosey, Severed Heads) with whom the owners and staff of the company were well acquainted (Harrison 1994). Toward the middle of that decade, Nettwerk established an international distribution agreement with Capitol Records (later purchased by Britain's EMI) for its artists. As popularity of a few of the label's artists grew, its operations began to increasingly resemble those of a major label. With both Sarah MacLachlan and Delerium contributing significant amounts of revenue due to strong international sales, the company could actively seek out and fund the recordings of lesser-known, locally-based artists (such as Ginger, The Ids, and Mystery Machine) without worrying whether each artist broke even or made a profit (Jowett 1994), a pattern of product development

common to core stream companies (Hesmondhalgh 1998). Additionally, the company moved into the realm of artist management (managing the careers of MacLachlan and the Barenaked Ladies, both to wild success), and opened a new headquarters in New York City.

The years leading up to Nettwerk becoming a small multinational "talent farm" of sorts saw the company forge increasingly close connections with both (1) well-known independent producers and recording studios, and (2) a large-scale distribution network, by way of Capitol Records (among other large distributors) (Jowett 1994). Unsurprisingly, as the small group of entrepreneurs at Nettwerk gained experience and international contacts over the years, their acts became known as "trusted" within the core music stream; many on the company's current roster (e.g., Avril Lavigne) likely know very little about the tribulations of "paying one's dues in indie circuits" prior to garnering international success and revenue. This story of the assimilation of Nettwerk, from its peripheral, independent beginnings, into the mainstream (core) music industry is quite instructive about wider trends (consolidation, increasing co-operation between indies and majors, the development of the indie "talent farm") in the global music industry during the 1980s and 90s (e.g., Hesmondhalgh 1998), Negus 1992 and Frith 1986)[2].

**Rough Trade**

Other independent labels have resisted this trend, not co-operating in core stream production networks. These labels have sought out smaller distributors (or tried to handle

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[2] It's so instructive that even the company names seem like mythic bastardizations of the adjectives used to describe their original positions: "Nettwerk" (network) and "Capitol" (Capital). Weird, huh?

their own distribution), independently owned record shops, and campus radio networks in order to reach much smaller audiences. There are some noteworthy examples of "success" in this manner. However, as Goshert (2000) describes, "success" means something very different in many peripheral (independent) music networks, as the companies and individuals involved are often motivated by an ethic that does not privilege high sales and high revenue for their own sake. Goshert characterizes both Dischord (in Washington D.C.) and Lookout! (in California) as the most well known examples of companies that have survived outside the core stream of music exchange (100). He explains that their longevity was partially the result of the companies' long-term commitment to foster local cultural spaces and local music as alternatives to "the totalizing tendencies of large scale (media)" (100). Such an ethos is rather incompatible with a co-operative attitude toward core stream networks of exchange.

The story of U.K-based Rough Trade records during the 1980s tells of a conscientious struggle between the mandate to remain independent (building an independent distribution network) and the pressures to compete with the majors. As Hesmondhalgh (1998) explains, this struggle reached into the conflict over how the organization should have been internally structured. Hesmondhalgh directly addresses the question of the "democratic" character of music companies and industry in the 1980s UK scene. He evaluates the "democracy" of the music industry in terms of two dimensions: (1) participation and access – equality of access across race, class, gender lines, and (2) decentralization of music technologies and organizations. He observes a tension between the internal democratization of Rough Trade and the company's wider democratizing aims (decentralizing the whole industry, including distribution and retail). Essentially,

Rough Trade had to engage in mainstream corporate practices to some extent (centralized decision making, unequal marketing efforts given to different artists on their roster) in order to elevate their media profile. On the other hand, they were still engaged in a complete avoidance of mainstream channels of distribution. Hesmondhalgh's analysis underscores the notion that majors and independents do not always work in close collaboration, as previously implied by Frith (1986). Instead, independent companies struggle to make to decisions about whether to embrace the mass market or act in a counter-hegemonic way *under market conditions established by the majors*.

It is impossible to adequately examine the differences between core and peripheral cultural production networks without reference to the structural limitations that are imposed by the oligopolies of distribution, exhibition and retail sectors (distribution and consumption networks). As I have illustrated, the conditions of music production (core or peripheral) are structurally influenced and restricted by the political economy of the core stream of music distribution and consumption.

## 2.4. Interventions: Ownership and Policy in the Music Industry

Currently, five recording labels (who own their own distributors) account for more than 80% of the music distributed around the world (CIRPA 2002). This distribution ratio is also true for Canada, where music sales are, proportionally, dominated by these few large multinationals (none of which are Canadian owned) (CIRPA 2002). These companies act as large distributors for their own music, in Canada and elsewhere.

Radio broadcast in North America is also currently dominated by a small group of multinational companies – partially due to the 1996 relaxation of ownership restrictions

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by the Federal Communications Commission of the United States. Thomson and DiCola (2002) describe how U.S. radio has since become dominated by four companies that account for 70% of all (advertising) revenue in that industry (3). Further, they convincingly argue how this concentration has led to increased format homogeneity across the U.S., and within individual radio market locations where the dominant companies own more than one radio station (4). In addition to the oligopoly maintained by the core stream record labels, ownership concentration in radio creates a second "bottleneck" for artists struggling to have their music reach audiences (4).

Canadian Content quotas try to address the problem of under-representation of Canadian artists on Canadian radio, albeit with no distinction between core and periphery. The MAPL system (Music, Artist, Production, Lyrics) defines Canadian content as musical works that meet two of the following five conditions: (1) music or lyrics performed by a Canadian, (2) music composed by a Canadian, (3) lyrics written by a Canadian, (4) a recording of live music performed in Canada, or (5) [after September 1, 1991] performed live or recorded, with a Canadian credited at least 50% as composer and lyricist (as maintained in the "Amendment to Radio Regulations", 1998). 30% of all radio broadcasters' repertoire (and 35% during prime time hours) must include music that satisfies these conditions.

However, format homogeneity and ownership are not adequately addressed by any current policy or regulation in Canada. The U.S. trend toward deregulation of radio ownership was echoed in Canada with the 1998 Amendment, in which radio ownership restrictions were relaxed (albeit not without important provisos, such as contributions to FACTOR and the development of a new talent development fund). Currently, the five

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largest radio corporations in Canada account for 63% of all radio advertising revenue, and 40% of all radio stations (CRTC 2001). No research into format homogeneity in Canada is available, but this phenomenon is likely ensured by unregulated, anticompetitive practices such as independent promotion and payola (Gorman 2002), practices still unfairly utilized by record labels who can afford to do so.

Since 1982, the Foundation to Assist Canadian Talent On Record (FACTOR, a fund set up by the Department of Canadian Heritage) has provided financial assistance for independent Canadian record labels and artists. However, access to these funds is, in practice, largely reserved for "independents" who have multinational distribution agreements. The policy objective of FACTOR meets the same fate as many cultural policies in Canada – assisting companies and artists who are more likely to become profitable and self-sufficient, at the expense of not assisting smaller companies and lesser-known musicians. A cursory glance at FACTOR's funding decisions over the course of 2002 is revealing in this regard; six of the seven most heavily FACTOR-funded artists (for video, audio recording, and promotion) had signed foreign, core stream distribution agreements prior to receiving funding from the government[3]. In effect, FACTOR appears to act more as a partially nationalized talent agency, feeding (and maintaining the balance of capital in favor of) foreign controlled, core stream music companies by investing in, and then exporting a select few Canadian musicians (Haverty

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[3] These artists are Swollen Members (EMI/Nettwerk), Zubot & Dawson (True North/Universal), Not By Choice (Linus/Warner), Spek (Echo/EMI), and Grimskunk (Aquarius/EMI). The other "signed" recording receiving top funding by FACTOR was a soundtrack CD for the film *FUBAR*, with the sound recording distributed by Aquarius/EMI. Only one of the top seven funded artists had no label or distribution affiliation prior to receiving grants [Clarknova, now with Shoreline/EMI]. A fuller analysis of FACTOR's funding decisions will be forthcoming from the present author.

2002) - rather than as a device to stimulate indigenous music production and industry.

The greater structural effect of this is a widening of the gap between core and periphery

in the Canadian music industry (Straw 1996).

These concerns about the capital structure of the Canadian music industry have

not gone entirely unnoticed by the federal government. Heritage Canada commissioned a

Task Force to look into structural problems of the Canadian music industry, and the

effectiveness of the federal policy framework in 1995. In 1996, the Task Force reported

back, offering a number of recommendations for current and new policy amendments.

Notably, the Task Force made two recommendations not addressed by the current policy

framework. The first of these recommended protection form the deleterious effects of

international trade agreements, by reversing the ongoing erosion of tariffs. They

explained:

> a rate of 15% the tariff on imported sound recordings was an important
> factor in maintaining a separate Canadian distribution system for sound
> recordings. However, the tariff is being phased out under the terms of the
> FTA and the NAFTA, with the rate now below 5%. (Task Force on the
> Future of the Canadian Music Industry, Canadian Heritage, March 6
> 1996).

Secondly, the Task Force recommended implementing Investment Canada guidelines for

music companies:

> The Task Force recommends that a fully refundable investment tax credit
> should be provided through the Income Tax Act to companies that are at
> least 75% Canadian owned and effectively controlled by Canadians. The
> amount of the credit should represent at least 25% of their qualifying
> expenditures to create new Canadian content master tapes and music
> videos. (Task Force,1996).

Seven years have passed since the Task Force's report, and neither of these

recommendations has been adopted. The Canadian music industry is predominantly made

up of peripheral musicians and companies, and current policy has the net effect of maintaining the division between the domestic periphery and the multinational core (with very few exceptions).

## 2.5. The Technological Disintermediation of Music Distribution

But the technological framework within which musicians work is changing dramatically, with the advent of digital audio formats. This phenomenon requires some specific analysis. Because each of the networks or sectors of the "core" stream (production, distribution, consumption) are structured differently (and each has relative power and influence within the chain of exchange), the impacts of technological changes in media are different for each.

Leyshon (2001) describes the current transition between bricks-and-mortar and electronic distribution methods as one of "disintermediation". In his words, low levels of asset specificity and low levels of product complexity in the distribution sector make it more susceptible to the process of electronic disintermediation than other networks:

> the current configurations of networks of reproduction and distribution are in themselves fairly effective barriers to entry to the industry. But the advent of software formats raises the spectre of these barriers being circumvented and of the industry being 'locked in' to an outdated paradigm of manufacturing and distribution" (69-70).

Technological disintermediation threatens to disrupt the "twin bottlenecks" of core stream distribution and broadcast more than any other musical network. For the core music distribution networks, this change is of the "code red" variety. In 2000, global sales of all conventional media for music distribution (CDs, singles, LPs, MiniDiscs, and cassette tapes) dropped by 1.3% in value (IFPI 2001:3), perhaps a significant trend

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considering growth in music sales in previous years. Most commentators attribute this pattern to online distribution methods and worldwide growth in CD-R piracy (RIAA Newsletter 2002). While the validity of this inference is debatable, it is important to note the widespread perception of the vulnerability of conventional distribution networks - and the blatant evidence of this perception is the core music industry's ongoing campaign to eliminate peer-to-peer sharing of MP3 files via litigation against internet companies, and individual MP3 users.

Conventional ("bricks-and-mortar") music retailers are already losing some market share to online music "etailers" (such as Cdnow.com, Amazon.com, and many others) who have far lower overhead and startup costs than a bricks-and-mortar record store - a "first wave of disintermediation" (Leyshon 71-2). Music etailers also have an easier time understanding popular music markets than conventional retailers, utilizing electronic forensic marketing techniques, and continual surveillance of site activity. This is made possible by the ways in which digital transactions generate considerable amounts of consumer data, something etailers now use to construct the "music consumer" (Kozinets 1998; Sivadas et al 1998). Largely because of the inflexible conditions of conventional distribution in the popular music industries, companies occupying this part of the chain have already proven most vulnerable to the new media of Internet and open format MP3 audio.

But as Leyshon points out, retailers are predominantly threatened by the prospect of direct digital sales and marketing by the Big Four record companies themselves (72), through ventures such as Pressplay and Musicnet. Leyshon's argument is quite convincing: that we are probably at the beginning of a new era of capitalization and

concentration, as music companies will soon be able to rid themselves of investments and costs in the capital-intensive operations of traditional networks of reproduction and distribution (73-4). The MP3 "revolution" may in fact turn out to be a war between two titans (music retail and music production/distribution).

Then again, core stream music companies face the problem of pirated MP3s exchanged over peer-to-peer networks. The MP3 pirate is the core music industry's most bitter public enemy at this point in time. This, more than anything else, threatens their oligopoly on distribution, as millions of computer users exchange music they have not paid for with millions of other Internet users, daily. The past two years have seen vigorous enforcement of the Digital Millennium Copyright Act (DMCA) at the behest of the Recording Industry Association of America (RIAA) and the Motion Picture Association of America (MPAA). In effect, the DMCA has been enforced in such a way as to give copyright owners tighter control over the digital reproduction of their works than witnessed in any previous era (EFF 2003). The DMCA has wide-reaching implications for consumers of prerecorded music. Not only is it illegal to download or upload copyrighted MP3s without a license, it is also illegal to discuss or publish information about digital rights management technologies, for fear that readers of this material will use the information to circumvent the copy-protection on commercially-sold compact discs. There is an ongoing debate about the limitations that this legislation places on free speech, and it is frightening to consider the wide range of (non-musical) scenarios in which the DMCA has been invoked and upheld[4]. In the interest of brevity and focus, it suffices for my purposes here to summarize the DMCA as another channel

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[4] For further reading on this subject, visit the Electronic Frontier Foundation's extensive archives about copyright and freedom of speech on the Internet [http://www.eff.org/].

through which core stream music producers are reasserting their control over music distribution.

Peripheral networks of distribution – typically local, ephemeral, small scale, and staffed with a smaller number of multitasking, often politically motivated individuals - may experience something of a renaissance as the result of the introduction of new media. Indeed, well-known websites (and radio webcast nodes) that distribute (or broadcast) independently made, digitally encoded music for free are already showing enormous popularity (e.g., garageband.com, newmusiccanada.com). As Frith (1986) argues, independent recording labels in the United Kingdom rapidly established alternative distribution networks in the early 1980s. They did so under much more challenging conditions than exist today, conditions Hesmondhalgh (1998) explicitly describes. Conventionally, independent record labels distribute CDs and records via small, independent distributors, and through direct ordering by independent retailers. Electronic channels of distribution are made possible for small labels by the use of MP3s and the Internet, encouraging many peripheral artists to sell their works through new Internet-based delivery systems, or to sell directly to audiences through their own websites. With Internet-mediated music, there are two important openings for peripheral music producers and distributors: (1) the unprecedented availability and plummeting value of Internet bandwidth, and (2) the potential to reach global markets without the limitations of physical distribution infrastructure. Radio and the CD distribution chain (both formerly dominated by core companies) both have digital competitors now. Thus, technological disintermediation appears likely to have different effects in peripheral distribution networks than in the core.

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As Wallis et al (1999) argue, the MP3 format raises the possibility of artists setting up their own Internet-based record labels and publishing companies, and to exploit their intellectual property rights (IPRs) in sound recordings through software formats and Internet delivery systems:

> Artists who become famous are often locked into long-term contracts with intermediaries. When such contracts come up for renewal, superstars are in an extremely strong position to recover and retain their IPRs. Such artists are commodified products in themselves they [increasingly have] access to alternative means of finance, and they may use new distribution technologies to control globalization and delivery process. This is the great fear of the multinational companies (9)

But this strategy is most profitable for artists who already have well-established fan bases and sufficient marketing capital to be able to attract an audience to their website. However, Brindley (2000) has illustrated cases where bands have found commercial success by distributing music through their own websites.

Remuneration for peripheral artists, labels, and distributors may be even more challenging as it is for those involved in the core stream (even though production overheads are far lower in peripheral streams). Peripheral entities, too, are challenged by peer-to-peer file sharing, though it is still unclear whether or not the wider exposure offered to independents through peer-to-peer file sharing communities is more valuable than any revenues possibly lost through this channel.

More than anything, independent distributors and retailers need to meet the challenge of combining their efforts to distribute music electronically if they are to survive. A number of companies sprang up in the late 1990s to take advantage of the possibilities of MP3 distribution (MP3.com, Amp3.com, among others). Alternative models of distribution and artist remuneration (ranging from donation-based downloads,

to competitive contests, and point-based systems) have emerged (neubauten.org, garageband.com, potatosystem.com). Some of the more popular independent music distribution platforms have been incorporated into the core stream through buyouts (for example, MP3.com, IUMA.com), and turned into little more than online music malls, with little remuneration offered to unknown artists (Borland 2001). Ramos' forecast - that "electronic media, such as the internet, may be the vehicle for an individualized global community to usurp control from corporate capitalist concerns and democratize distribution or destroy the concept" (2000:24) - is only partially coming true. As Leyshon argues, (peripheral) electronic distribution networks will likely persist alongside mainstream electronic networks, so long as the current structure of the Internet remains intact. The remaining question for peripheral distribution and retail, though, is whether independent music distribution companies, or emerging core stream online specialty retailers and artist websites will dominate these sectors.

What is unlikely, however, is that the relationship between core and peripheral distribution networks will remain the same as it was in the pre-Internet era. No longer is there the high cost of entry, and bottleneck-like control over broadcast, manufacturing and distribution. Internet radio is virtually unlimited in bandwidth, and is as yet unregulated. "Manufacturing" MP3s merely requires a personal computer, eliminating the need for CD manufacturing plants. And, electronic distribution is cheaper and, exponentially, more rapid than conventional distribution. While competition between the core and the periphery might appear to be fierce at first, competitive advantage will likely still depend on access to distribution and broadcast networks, as in the past. As I have outlined, in the past, the core stream companies' oligopoly on distribution networks

ensured them a severe competitive advantage in reaching music audiences. The new networks of distribution will depend on large amounts of Internet bandwidth to distribute music widely. Bandwidth, then, may be a primary locus of competitive advantage. A recording company that distributes its own music online will use significant amounts of bandwidth. An artist cannot hope to upload as much data to its fans via a personal Internet account as it can through a record label with unrestricted bandwidth. And, as mentioned previously, access to marketing capital will undoubtedly have a decisive impact on the competition between core and periphery online. As such, the power to distribute music may be ultimately restricted by the ongoing convergence of core stream recording companies with large Internet service providers (e.g., AOL/Time-Warner). Considering this, it is unlikely that electronic disintermediation will lead to a permanent decentralization of music distribution.

## Chapter Three: Networks of Productive Consumption

In the production of music, the structure of another network – a network of "productive consumption" – has direct, profound effects on the way music is actually made. This network consists of the relationships between musicians, engineers, and producers, as they articulate around musical instruments and audio recording technologies. Membership in (and structure of) this network seems to vary considerably over time, depending on the types of technology available, and the ways in which music-makers implement them. In this section, I will first discuss the structural changes to this network as they have manifested in the era of multitrack tape recording and MIDI (Musical Instrument Digital Interface) synthesis (roughly, 1960 to present). I then expand this discussion to include the contested role of sound reproduction technologies in music making: whether, and if so, how, they may also have a "decentralizing" effect on music production. It will be seen that this network, too, has its own core and peripheral streams of interaction. The overlap of the core and peripheral streams in this network varies over time, depending on (1) the accessibility of particular types of technologies, (2) the ways in which these technologies are structured for their perceived markets, (3) the tendency for independent musicians to use technologies in ways that were unintended by their innovators, and (4) the variable similitude of music production and reproduction technologies. Using this approach, I conclude with an analysis of core and peripheral music production streams along a continuum (with production and consumption practices at either extreme).

### 3.1. Multitracking, MIDI, and (Re)Production: Structural Changes in Practice

Much of the history of what might be called "peripheral" productive consumption

networks is unwritten (prior to the advent of MIDI and inexpensive multitrack cassette

recorders in the early 1980s). This is because, until the 1970s, the recording industry held

a monopoly over access to recording studios (Jones 2002: 217). Hence, the beginning of

this story concerns the adoption of multitrack techniques in commercial, "core stream"

settings (prior to its diffusion to peripheral musicians).

The relationship of music production technology to musical practice and

aesthetics may be characterized as a feedback loop between technique, aesthetics, and

economy. Olivier (1999) writes that

> the work of many rock bands and musicians owes as much to 'the
> technology they use to realize their ideas' as to the ideas they use to
> 'divert' technology and, quite often, the recording and production
> techniques with which they experiment at a certain time have an influence
> on the conception of the machines subsequently available (357).

Olivier argues that an aesthetic trend among 1960s musicians and producers- the double

tracking of single sound sources, such as a singer's voice – led to an impetus for

improved multitracking techniques. Once more complex machines were developed to

meet this need (4 and 8-track recorders), Olivier argues, the multiple tracks available on

tape came to be used to isolate individual instruments and voices, in addition to double-

tracking single sound sources. The increased number of tracks made available by the

technology were thusly used to make the recording process more efficient. In the process,

music recording situations became increasingly rationalized, and musicians increasingly

alienated.

As Théberge (1997) writes, the commercial adoption of multitrack recording (during the 1960s and 1970s) contributed to a fundamental reorganization of production in popular music. Its adoption coincided with modifications to conventional recording processes on a number of levels. Physically speaking, commercial studio architecture was reorganized to facilitate sound isolation and control of reverberation (217). The human architecture changed, too: sound engineers became a part of the creative process of music (Kealy 1979; Ramos 2000). As alluded to previously, the "flexibilization" of mainstream music production led to independent producers[5] becoming more involved in recording music (Peterson and Berger 1971), often taking on supervening roles in aesthetic decision-making (Hennion 1989:402). So musicians had to adapt to both (1) the temporal and spatial separation of performances, and to (2) the increasing practical involvement of sound technicians and music producers, (a somewhat restrictive, though wider, field of creative players and auditors).

The increasing creative hegemony of independent producers inspired the subsequent trend of "artist owned" home studios (in the 70s and 80s); artists desired greater artistic control than producers, whose intervening roles were seen by many established musicians as overly intrusive (Théberge 219). Kealy (1982) argues that further transformations to the mode of collaboration in music recording took place with this development. Musicians became increasingly responsible for aesthetic decision-making during this period, and in doing so, they came to rely extensively on the skills of

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[5] "Independent" is something of a misnomer here, as producers are usually hired by recording companies for their abilities to make music palatable to specified markets. In this sense, their "independence" has nothing to do with degree of engagement with "mainstream" music practice. The reason for their presence in recording environments is usually to oversee recordings in the interests of the companies who hire them: to ensure that the recorded product turns out according to the company's vision of market expectation. The reason why they are called "independent" is that they are subcontractors, and not record company staff.

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audio engineers. Musicians also increasingly became enmeshed in new spheres of knowledge (other than strictly musical ones): acoustics, technologies (microphones, especially), and electronic signal processing, among others. Musical production became, more than ever before, subjected to rational processes of objectification and abstraction (imagining music in terms of the language of sound processing and mathematics rather than the language of music). The 80s saw the arrival of the hyphenated "songwriter-producer' (Théberge 221). The founding of artist-owned studios also indicated a reconceptualization of the musician as one who works in solitude.

This history speaks predominantly to changes in "core" stream networks of productive consumption. The emergence of visibly "peripheral" networks of productive consumption is marked by the wide adoption of two technological developments in the early 1980s: the consumer-grade multitrack recorder, and the digital synthesizer (equipped with MIDI). The success of (relatively) inexpensive multitrack cassette recorders (first appearing on the market in the1970s) depended on their appeal to a wide market of amateur and semi-professional musicians (Théberge 221). The diffusion of this technology brought the production techniques of core networks (multitracking) to the periphery, albeit on a much more limited scale (the most common models being capable of recording only four independent tracks). But seeing that independent musicians usually have less access to capital than musicians connected to the core stream, their access to professional sound technicians and recording studio rooms was also limited. Hence, there has been a stronger incentive in peripheral streams of productive consumption to learn audio processing skills that are, in core streams, more often the province of specialists.

There has also been a stronger incentive to purchase digital effects devices that are capable of simulating the aural characteristics of rooms of varying sizes (Olivier 1999).

Not only were independents who adopted the multitrack pressed to learn sound processing skills (and hence subject their music to the rationale of audio analysis) in order to make recordings; effects of this technological diffusion were pronounced in the ways independent musicians organized themselves around the act of recording. While many professional, "core" stream music-makers worked in large, highly social, business environments (the commercial recording studio, or the artist-owned commercial studio), independent musical practice took place in domestic environments (Théberge 1996: 222) as well as the small scale "business" environments of band rehearsal spaces.

The implications of musical work in domestic space are manifold. The home use of multitrack recording technology was an entirely different practice from the parlour-based pianoforte of the nineteenth and early twentieth centuries. Both the design of multitrack recorders and the aesthetic preferences that this technology represents (sound isolation, increased rationalized control) are at odds with domestic environments. To begin with, it is something of a "backstage" activity, like clothes washing, auto repair, or renovation: one that visitors to a household do not witness. Further, multitracking is also an isolated activity *within* domestic populations. As Théberge writes, home music recording is usually separate from family life in almost every way – and it is gendered too: "a private space within a private dwelling" (234). Multitracking in the home is usually located in bedrooms, basements or dens. Headphones are standard equipment in the home; the organization of sound in domestic spheres is inconsistent with sound's

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organization in music recording environments, and adjustments in practice must be made
to facilitate both.

The concurrent arrival of MIDI (a standard protocol for digital communication between electronic musical instruments) was another important step in this trend (of abstracting musical practice, while widening its accessibility, and increasing the isolation of the musician). There are several unique implications for practice in these developments. First, like musical notation, MIDI communication abstracts the language of music, keeping it separate from its manifestation in sound. But it also abstracts performance gestures, something traditional musical notation practices reserved for the discretion of performers and orchestra conductors (Théberge 222). Moreover, automation of entire performances became a common practice in music recording, for both professionals and amateurs (core or periphery). It is far cheaper (and more efficient) to emulate en entire orchestra or band by using the synthetic substitutions of digital synthesis and MIDI than to seek out, employ, organize, and record a group of musicians. The cost efficiency of both MIDI and multitrack cassette recorders lured many people into making music. A new class of amateur and semi-professional musicians sprang up around these technologies. Like (and perhaps more so than) their core stream counterparts, these musicians on the periphery learned to record music cheaply, quite abstractly, and in solitude.

Since its introduction in the late 1980s, the digital audio workstation (DAW) has retained many of the features of both MIDI and multitrack recording. Software designers use the multitrack recorder as a metaphor in their design of graphical user interfaces [GUI] (Théberge 228). Adapting the multitrack to the common display and interface

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environment of the personal computer has brought with it some particular problems and limitations. In terms of common display devices (computer screens ranging from 14 inches to 21 inches of viewable area), it is only barely possible to display detailed track information on anything more than a track-by-track basis (228). This would seem to fragment the process of recording even more than was the case previously; the limitations of the computer screen force musicians' attention toward the fragments that make up a song, rather than toward the song in its entirety.

From MIDI music systems, the DAW inherits the problematic dominance and efficiency of step-entry recording, the hallmark of drum machines and MIDI sequencers of the 1980s (Théberge 1997:224). Part of the reason why this was so conveniently inherited by the DAW is that the prevailing physical interface of personal computers (the WIMP interface – the abbreviation for windows, icons, mouse, and pulldown menus) suits this rationalized, yet very unmusical mode of interaction with a music machine. Manning (1999) discusses the limitations of visually oriented sound manipulation interfaces. He argues for greater tactile control in future technological innovations in computer music, as the WIMP interface (lacking direct, tactile, expressive control capabilities) is counter-intuitive in terms of contemporary audio recording practice. The limitation on parallel control operations (for example, simultaneously manipulating more than one volume fader) in real-time is one of the most serious challenges with a WIMP-interface audio system (58), among other challenges.

The era of the tape-based multi-track recording studio may be on the wane. The primary reason for this is the adoption of inexpensive computer-based audio recording software, in (1) home-based DAW environments, (2) new independent digital studios,

and (3) established commercial studios. As Leyshon (2001) has pointed out, music production networks may experience serious financial challenges (and upheaval) as costs of entry into music production are reduced. Home-based digital studios have the potential to undercut commercial studios (competing for other musicians' recording budgets), whose overhead costs are much more difficult to recover. The fact that music software is widely (and freely) accessible (in pirated versions) over peer-to-peer networks makes the costs of starting up an independent studio even lower, despite the illegal nature of this activity. Many musicians (core or peripheral) may begin to forego commercial studio recording altogether. Peripheral musicians may do this out of necessity. Considering the music industry's current fears (about loss of revenue due to digital piracy and other factors), core stream music companies may restructure their contracts with artists to reduce recording budgets, forcing artists to work digitally, instead of in costly recording facilities. Whatever the case may be, the business of professional audio recording seems headed for troubled and interesting times if digital audio software continues to be adopted, both in the core and the periphery.

But while increased accessibility is one factor in the potential for change in production networks, there is at least one more factor: the similitude of production and reproduction technologies. The accessibility of music production tools has a varied history, oscillating between situations wherein reproduction and production media are nearly identical, and other situations wherein they consist of different technological artifacts, produced and distributed by whole separate industries. As Negus (1992) and Frith (1981) argue, the closer the identity between reproduction and production technologies, the more decentralized music production seems to be. There are two prior

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developments in the history of music reproduction technologies that bring this point into sharp relief: the demise of the cylindrical phonograph, and the struggle over home taping in the 1970s and 80s.

Negus (1992) describes how, in the early 20th century, competition between the producers of cylindrical gramophones (which could record and make copies of the wax cylinder medium) and producers of the flat disc gramophone (whose platter discs "required organized pressing plants") underscored, for the first time, many of the problems of control of the mechanical reproduction of music. The flat disc gramophone was "better suited to the capitalist system of production and distribution because it was harder to make pirate copies and, hence, the companies were able to control its manufacture more easily" (22). The emerging trade in prerecorded music at the time adopted the flat disc format in order to secure control of music distribution. This "problem" of reproduction resurfaced in the 1980s with the music industry-led campaign to eliminate home taping (22).

Several well-known authors consider the ability to reproduce music as audience participation in redefining meanings of forms through consumption. Hebdige's writing on youth subcultural theory (1979) gives considerable attention to how portable cassette recorders 'decentralize' music, allowing a wider range of people to participate in musical practices. Frith (1986) and Chambers (1988) both concur – that the struggle of audiences with the cultural power of capital and the state is embodied in "the continual appropriation of pop's technology and reproductive capacities" (Chambers 1988:609). According to Frith, the cassette recorder is one of the audience's most effective "weapons" against the version of culture capital would impose on them (1986: 278). That

is, making home recordings, compilation recordings, and pirated copies of prerecorded music are counterhegemonic practices by an "active audience". Remixing prerecorded music, and record-scratching are also oft-cited examples of public re-appropriations of popular culture (Rose 1994), whereby impoverished youth become culturally empowered.

However, Ramos (2000) takes issue with the idea of the active audience, making a careful distinction between "consumptive audition" and "appropriation with music making" (22). Ramos argues that music making and audition have been separated, removed from local cultural context, and reintroduced as consumptive acts through control of distribution (22). A better understanding of how consumption and production practices actually differ merits some detailed analysis here, if we are to assume that practices of "consumptive audition" have the potential to open music "production" to a wider body of participants.

Making compilation recordings of commercially sold music (consumptive audition) is an entirely different sort of "participation" than is record-scratching (a productive appropriation of music technology). I see this distinction on two dimensions: aesthetic practice and political economy. Record-scratching directly modifies the original recording in ways not initially intended by the record's original author. In the ghettoes of Harlem and the Bronx in the 1980s, the practice also ruptured the flow of mainstream music distribution, creating alternative spaces for music production (Rose 1994). The act of making a compilation mix-tape leaves the original recording intact, though re-contextualized. This practice is not an intentional rupture of any political economic

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structure; it is merely a practice of consumption – analogous to the "commercial skip" function on Video Cassette Recorders.

The widespread piracy of MP3s may be viewed in similar terms. Aesthetically, the original recording is unmodified. As well, any "rupture" to established channels of distribution brought on by the practice is merely an accidental, systemic byproduct of it. The primary use of MP3s is to obtain, share, and control the conditions of audition of music; it is not to create alternative creative spaces, nor to create a new musical work. Hence, the phenomenon of MP3 file sharing does little more than change consumptive audition practices so that they are more audience-driven: the digital mix tape, the digital radio, the digital auditorium.

But the DAW inherits something else from the MIDI era – and magnifies it. The practice of automation using synthesis and MIDI has resulted in a blurring of production and reproduction (Théberge 222-3). The use of synthesizer preset sounds and audio samples in sequenced music opened up a whole new practice around the reconstruction and re-contextualization of sounds previously used in other works of music (Goodwin 1991). Computer hard drives and processors are extremely flexible media – capable of performing tasks ranging from audio production, to video production, to photography, to graphic design, to instantaneous communication, to music audition, and to many others. The combinatory effects of music computer software are also evident in the ability to import and export audio files (from MP3 to WAV or to AIFF, or any other format) to and from music software programs. Computer music software packages combine the capabilities of multitrack recorders, digital samplers, MIDI sequencers, and digital synthesizers into a single application. Unsurprisingly, this trend has resulted in the

phenomenon of the "fan-made cover tune" (Strauss 2002), in which music fans (consumers) are transformed into remixers (producers), and either celebrate, satirize, or deride their favorite or least favorite commercial artists. More than ever before, the production and consumption networks of music seem interpenetrative.

All of the practices I have mentioned– from "consumptive audition" practices (i.e., MP3 playlists) to "productive appropriation" practices (samplers, turntables, mixing decks) to "musical recording practices" (MIDI, DAW recording, synthesizers)– may be organized on a continuum of music use and practice. At one end of the continuum is the custom playlist of MP3 players and the mix-tape, which may be exported, exchanged, or transported. Here, music is rearranged and recontextualized, but the original recordings are not altered. In the middle of the continuum are the users of samplers, turntables, and mixing decks. This group remixes prerecorded music in ways that alter the original, and create a new original out of the source material. At the other end of the continuum are the users of DAWs, MIDI, and conventional recording equipment – who, in the most extreme "producer"-type cases - record entirely new sounds from physical audio sources, and arrange them into compositions.

None of these practices are exclusive (as I have pointed out, some DAW users also engage in remixing or turntablism, and many users who begin with consumptive audition move into serious DAW use within a short period of time. But the main points that should be taken from this analytical framework are that the line between production and consumption is blurrier in an age of digital reproduction, and that the current technological assemblage of music making artifacts accommodates the amateur, the independent, or otherwise peripheral musician in many different ways.

But two features of the current technological assemblage (computers, the Internet) have important implications here: (1) the ease with which music software may be obtained and adopted, and (2) the uniform user interface of computers across a range of applications. One who is capable of copying MP3 files is potentially equally capable of downloading, installing, and learning to operate computer software that modifies the original recording. This may increase the blurring of consumption and production in popular music, in that both financial and technical barriers (to musical practice at the "production" end of the spectrum) are reduced.

So the questions arise: who is the contemporary digital musician? What are they trying to achieve in their studios, and how are they trying to achieve these goals? And finally, how is their use of computer technologies altering the way they interact in musical networks? The technological precursors to the DAW - multitrack recorders and MIDI-equipped digital synthesizers - were carefully marketed to professional, semi-professional and amateur musicians simultaneously, using product lines structured by price points. Each type of consumer could be distinguished on the basis of user needs, and level of available capital. This perception of "musicians as consumers" of varying types has had a profound effect on the development and marketing of computer software for music recording. It is a detailed look at the music software industry's construction of the consumer that I now turn to.


### 3.2. The Market Construction of Computer Audio Software Consumers

The gamut of DAW software products on the market is presently segmented in several ways, according to the types of musician-consumers visible to companies such as

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Steinberg, Digidesign, and Emagic. By examining the design and marketing of these applications closely, there are at least three distinct continua on which the musician-consumer appears to be regimented: MIDI-familiarity, level of "professionalism", and openness of standards. The arrangement of professional audio recording software packages along these continua makes for an approximate breakdown of the music software-buying public – ranging from musicians relying solely on automation and soft synthesis for their works, to professional studios recording rock bands "live off the floor", to the amateur developer-programmer-musician who furiously writes code to create better plug-ins for him/herself, and to the weekend dabbler wanting to record their child's ukulele concerto onto their laptop using the "low end" version of Cubase.

The corporate narrative goes as follows. In the early 1990s, software based multitrack audio recording was only possible on expensive, proprietary systems (a market dominated by Digidesign's ProTools software and hardware). ProTools began their product development with a four channel recording system, and progressively developed products along a proprietary design regime. The following decade saw an intensification of innovation in two sectors: (1) MIDI sequencing/audio software developed by small upstarts (such as Steinberg, Emagic, Propellerheads, Cakewalk, and Sonic Foundry), and smaller, cheaper, all-in-one hard disk recorders (put to market by former giants of the home recording industry like Tascam, Yamaha, and Fostex). A slight growth in market share[6] for software companies (most notably, Steinberg) has led to a climate of strategic consolidation in the current digital audio marketplace.

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[6] At the time of writing, market statistics for Emagic, Cakewalk, and other companies were not available. Steinberg, however, reports total revenues of EUR 13 million (1999), increasing to EUR 22 million in 2000 (Steinberg Company Relations website) A mere 'breakaway republic' to Avid's 'empire', to be sure.

The case of Digidesign and Avid illustrates the present trend of corporate concentration and horizontal and vertical integration quite well. Digidesign (a division of Avid since their acquisition in 1995) is the leading developer in the digital audio editing field, reporting $476.1 million US in revenue for the fiscal year of 2000 on their corporate website. Avid has close ties to software giant Adobe (the developer of the film industry-standard Premiere video editing software). More recently, chip innovator Intel invested $14.75 million US in Avid (Reuters 1997), with an explicit expectation that Avid focus their development efforts on software compatible with Microsoft platforms and the consumer audio editing market. Avid has numerous other development agreements with large media companies, including Microsoft and NBC (Avid Corporate website) More recently, an apparent partnership between Avid and Emagic (developers of the LogicAudio MIDI sequencing platform) has resulted in the first true cross-application compatibility for the ProTools system (Emagic website)

Avid/Digidesign has aggressively sought to control the fastest-growing sector of the digital audio market – home studio products - not only by their strategic corporate alliances, but also by revising their product range (a version of ProTools that works with standard low-end audio cards was introduced several years ago), and privileging simplicity in their graphical user interface (GUI) design:

> "*Pro Tools*' design concept has always been to keep all production work within the two main (audio and mixing) windows, so all editing is performed *in situ*" (Price 2001, emphasis in original).

Conversely, Steinberg's Cubase presents a more challenging GUI, presenting windows upon multiple windows for different tasks (arranging, scoring, mixing, sound editing, MIDI step-sequencing, virtual instruments, and so on). Clearly - if electronic

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music "trade" publications (such as *Sound on Sound*, or *Electronic Musician*) and Internet user forums (such as cubase.net, or unicornation.net) are reliable barometers - ProTools wins, hands-down, in the "ease of use" department.

But companies like Steinberg and Cakewalk approach the home studio market from a very different position. Steinberg, for example, has continuously released products in three simultaneous price categories – with a "top end" version of their software (now including 32-bit recording capability), a "middle" category (which now includes a conventional musical notation editor), and a "low end" (no-frills) version. The home computer-based studio is the stock-and-trade of these smaller companies. Emerging at first as developers of MIDI sequencing platforms, Cakewalk (whose 'Mastertracks' program evolved into the eponymous 'Cakewalk', and more recently into 'Sonar') and Steinberg (whose 'PRO 16" evolved into 'Cubase VST', which has now branched into 'Cubase SX' and 'Nuendo', for MIDI sequencing/audio recording and video postproduction audio recording, respectively) relied on customers for direct feedback (via the Internet) on their offerings over the years. These companies' targeting of the byte-savvy, nascent electronic MIDI musician scene of the early 1990s led to the development of small but loyal customer bases.

Direct feedback from this sort of consumer group has led to a very different sort of product development for these smaller companies. Nowhere is this more apparent than in the comparison of the audio protocols and software standards employed by Digidesign and Steinberg.

On the issue of audio protocols, there are two (sharply divided) classes of DAW software applications: *proprietary* and *non-proprietary*. In terms of *proprietary* software

systems, there are essentially two dominant ones[7]: Digidesign's ProTools, and Mark of

the Unicorn's (MOTU) Digital Performer. Referring again to the Digidesign example,

what makes the software a *proprietary* system is its exclusive use of a trademarked

digital audio standard (TDM, or Time Division Multiplexing), which is also used, and

exclusively so, by the company's hardware products. As such (on top-end Digidesign

systems, at least), digital audio information is recorded in a format that is unrecognizable

by other software and hardware products. It is thus difficult to swap ProTools audio files

between the ProTools application and other audio applications, or to use them with audio

hardware that do not support the TDM standard. This has much to do with Digidesign's

efforts to dominate the professional audio hardware market. As Simon Price recently

wrote:

> Those anxious to know if they can persuade the free *Pro Tools* to access
> more than two channels of hardware via non-Digidesign soundcards will
> be disappointed. Digidesign's core business is hardware manufacture, so
> it's no surprise that while they make every effort to accommodate other
> companies' software on their hardware, they don't do the reverse (Price
> 2001).

*Non-proprietary* DAW packages employ their own audio standards, such as

Steinberg's popular ASIO (Audio Stream Input Output), and Cakewalk's WDM (Win32

Driver Model). ASIO is a generic audio interface between a software application and

audio hardware. What this means is that any projects created with audio cards and

software applications that are ASIO-compatible are swappable[8]. ASIO has become

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[7] I am deliberately excluding high-end, hardware-integrated proprietary systems like Radar (which *exclusively* targets professional audio production markets) and multimedia-oriented applications like Bias Peak (which is primarily targeted to video post-production professionals).

[8] Recorded audio files themselves, however, are more "swappable" between platforms. The Project files for the different platforms are incompatible, structurally confining editing and mixing tasks within one software platform only. ProTools mixers and Cubase mixers cannot easily share their work across applications.

something of a standard driver for most computer audio hardware manufacturers (including MOTU, Aardvark, Edirol, Swissonic, RME, and many others). The reach of this audio specification permits the user to make choices about customizing their system with reference to a wider array of products than is possible when proprietary software is at a home studio's core[9].

Similarly, Steinberg offers a further type of consumer-interaction with their products: Open Source development. Part of the source code for Cubase VST is made public so that those who are so inclined may write their own plug-ins based on personal GUI and/or aesthetic preferences[10]. The main point to be taken here is that part of Steinberg's marketing strategy is to incorporate a limited form of Open Source development for the buyers of their product.

The "Cubase consumer" is perceived by the seller as quite a different species than is the "ProTools consumer". In contrast to Digidesign's notion of the musician-consumer as "audio professional", Steinberg has a vision of its customers as (1) more reliant on computer automation than audio processing (i.e., including more sophisticated MIDI capabilities), and as (2) more "active participants", in both the hardware configurations of their home studios, as well as the customizing of their software.

Top-of-the-line computer audio software is increasingly expensive, and optimizing a computer to work like a digital studio requires larger capital investments, as computers become reorganized around consumption and not production. Despite Apple's

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[9] Recently, however, the line between proprietary and non-proprietary systems may have begun to blur. More and more hardware developers are making their systems compatible with the full range of software audio protocols. As with the development of the MIDI standard, computer-based software and hardware developers may be on a trajectory towards standardization.

[10] But the question of whether or not Cubase users actually *do* this is not examined here, for reasons of brevity.

campaign in 2002 to promote their new Imac as a "digital lifestyle hub", (complete with demonstrations of teenagers making skateboarding videos, and luminaries such as George Lucas extolling the 'democratizing' power of technologies like Final Cut Pro), increasingly, the "digital lifestyle" Apple is promoting centers around consumption (the iPod MP3 player) and vanity (home movie production, photo album services), not around enabling a computer to do things usually reserved for high-tech audio or video professionals. Apple's newest computers are not equipped with stereo audio inputs, as they had been previously so equipped. To connect a microphone to any new Apple computer (with the exception of their top-of-the-line Powerbook or PowerMac series), the user requires a USB or firewire interface (which are costly, and are scaled in price along their own price points).

So while it may be true that the *technology* of the DAW is opening some doors to production for some musicians, this may not have a "decentralizing" effect on music production. Limitations on this "decentralization" may come as the result of decisions made by a shrinking number of music software and hardware companies. Companies like Steinberg, Avid, and Cakewalk are positioning themselves to better understand and control their markets. To do this, they form strategic corporate alliances, and they regiment their software and hardware products along price points, according to ideas they have about musicians and their needs.

The construction of consumers during the development of MIDI is quite instructive in this regard. The industry began to strongly differentiate two types of consumers: the high end user (for whom programmability was important, in more expensive synths), and the low end user, for whom the availability of prefabricated

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sounds would be important: "changing perceptions within the industry were thus the first step towards the *production* of a new kind of consumer for digital musical instruments" (Théberge 76). This differentiation has been echoed in the marketing of the DAW. The music software industry differentiates customers on the basis of professionalism and access to capital, with the use of scale-priced software, hardware, and hardware compatibilities. For all the money they save in their recording budgets, independent musicians who adopt the DAW as a production tool are entering into a culture of consumption in which they have more restricted technical access to the tools that they use. The economic barriers of the old may be replaced by the technical barriers of the new.

### 3.3. Computerized Creative Work and the Fetishization of Technology

The DAW threatens to disintermediate production networks, and these effects are likely to revolve around the relationships established in productive consumption networks – where the core and periphery are structured and reinforced. The degree of decentralization will depend on the interpenetration between core and peripheral production networks that the structure of productive consumption allows.

Because of high levels of asset specificity (complex combination of skills and technologies) and product complexity in music, and given the difficulty of describing music on anything other than its own terms (Daniels and Klimis 1999), production networks are said to be inherently resistant to electronic disintermediation. Scott (1999) is perhaps correct to argue that centres of creativity are unlikely to disappear in the wake of the capacity to distribute music as pure digital content.

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However, Leyshon (2001) argues that production networks (he calls them networks of creativity) are vulnerable to processes of electronic disintermediation in their own right. He argues that the increasing prevalence of home computer-based audio recording software has

> two important implications. First, as in other areas of the economy, electronic markets in music are likely to have deflationary outcomes, putting pressure on the hourly fees currently charged by recording studios and by specialized labour within networks of creativity (2001:68).

The computerization of digital audio recording might also be viewed as one part of a more general trend in the computerization and automation of work in other fields – clerical work, publishing, communications, graphic design and photography, and video production (among many others). Effects of computerization in these types of work (artisanal and service sectors) have been overwhelmingly diffusive and destructive of communities of workers. A number of impacts on the conditions of work have been felt: a cycle of de-skilling through automation, re-skilling and retraining to keep up with software upgrades, increased demands upon workers for speed and efficiency, the emergence of telework, the diffusion of work from the "workplace" to the domestic sphere, the re-organization of domestic space to accommodate work, computerized surveillance of employee communications, the social isolation of workers, and a wave of layoffs in information technology and clerical sectors (Dyer-Witherford 1999).

As I have already observed, some of these problems have already presented themselves to individuals working in music. As was the case with MIDI and multitrack in the 1980s and 90s, the design of the DAW may (1) deepen the rationalization of music and sound, (2) fragment the processes of musicmaking into isolated units or steps, and (3) augment the alienation experienced in recording situations (Théberge 1997:223).

Particularly, these effects manifest in ways similar to those found in other sectors of work: de-skilling and re-skilling, an increased imperative for efficiency, an imperative for remote collaboration, work in the domestic sphere, and the social isolation of musicians.

The de-skilling and re-skilling of musical work is already being felt in networks of production. A growing number of musicians are foregoing the traditional route of hiring an audio engineer or booking a commercial studio to create music. Some audio engineers and producers (especially the ones operating smaller, less-profitable studios) may face challenges in paying for their equipment due to the lack of demand for their services. Additionally, musicians themselves may become further enmeshed in a culture of audio analysis and technology consumption, wherein the technical standards of audio recordings are raised, and musicians are encouraged to continually upgrade their mixing and signal processing skills, and their equipment.

Relatedly, musicians working for money may feel pressed to speed up work processes through automation. This impact will most likely be felt among musicians, producers and engineers working in the core stream of the music industry. However, many peripheral musicians wishing to "cross over" to the core (and perhaps earn some money for their work) may be equally subject to this phenomenon as well. For example, software products such as Steinberg's Virtual Guitarist are pitched primarily on the basis of a promise to increase efficiency for musicians doing commercial work (scoring for television, film, radio, and advertising) (Batzdorf 2002). The process of continual upgrading of skills may center around the consumption of innovative, user-friendly technologies such as these. The upgrading required of musical workers may in effect manifest in the consumption of more products (truly a network of "productive

consumption").

Some of the music software companies pitch their products based on the mobility of musical work using digital formats. The cheap ubiquity of CDs and DVDs for data storage permits musicians and engineers to store their work for use in another location. The emergence of technologies for remote musical collaboration over the Internet (the Rocket Network) is perhaps a sign of things to come for musical work. I have a critical question here: is musical collaboration to become more commonly practiced by musicians separated in physical space? What other factors influence the spatial organization of musical collaboration?

Finally, the possibilities for work brought into being by digital audio software herald a deeper intrusion of creative work into the domestic sphere. As with MIDI and the multitrack, musicians increasingly have opportunities to work on projects at home. The potential of this phenomenon is twofold: the reorganization of sound and space in the domestic sphere, and the abandonment of former sites of collaborative musical work. This individuation of practice may be reinforced, as I have already pointed out, by the personal computer's single-user interface design.

Further complicating the problems of computerization in creative work is the technophilia and idealism surrounding it. The proliferation of computer applications in creative work bears a promise of efficiency, and the contestable promise of liberation and democracy. In one sense, this ever more sophisticated audio software offers the musician an unprecedented degree of aesthetic control of the sounds they create. This feature of unrestricted control is highly valorized in the advertisements and advertorials for Steinberg, Digidesign, and Emagic products. The websites for these companies

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frequently invoke notions of "artistic freedom", "creative autonomy" and a "do it yourself" (DIY) ethic in their pitches to consumers.

The problem with this technophilia is its hidden problems: the imperative for individuated, autonomous efficiency and rational control over sound may take precedence over concern for structures and institutions of a musical community organized around practice. The abandonment of collaborative recording in rehearsal spaces, the automation of parts of (or all of) songs formerly played by musicians, and the dissolution of former networks between musicians and engineers and recording studios may have detrimental, outwardly-spiraling effects on peripheral music communities – which, as I have said, rely on healthy social relations around the practice of music. Ironically, the appeal of computers in musical activities is something that potentially undermines peripheral communities of musical production; the "DIY" ethic, so pervasive in peripheral music scenes, may be conceptually substituted by the artificial "DIY" ethic trumpeted by developers of audio software products.

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A peripheral network of music production, then, may be seen as the product of several networks of exchange: the "core" recording industry and the industries of sound production and reproduction, with the more recent addition of the computer hardware and software industries to this formula.

While the technologies of audio production and reproduction at times appear to promise a decentralization of music making, any peripheral music network is subject to the constraints of the core music industry's attempts to maintain control of the technologies of distribution. The peripheral music network is also under the constraints

that are built into the features of production technologies, which are typically designed with market-structured cost prohibitions. And, currently, the technologies of music production, reproduction and distribution are converging onto the desktop computer. In future years, the computer is likely one of the most important sites of struggle for the peripheral musician trying to make their voice heard - amidst the noise of modems, hard drive fans, and computer-generated click tracks...

## Chapter Four: A Methodology for the Study of Popular Music Practice

### 4.1. Problem Orientation

In Chapters One, Two and Three, I described how musical practice is significantly shaped and structured by (1) networks of music distribution, and (2) networks of productive consumption (music software and recording technologies). My description suggests three broad problems about the contested nature of digital technologies in networks of music practice:

> (1) how the nature and accessibility of production, reproduction, and distribution technologies affect the character of peripheral music production networks,
>
> (2) more specifically, how the nature of production technologies affects conditions of creative work, and
>
> (3) even more specifically, how production techniques, in large part constructed and restricted by the design of music software, reinforce categories of users within production networks.

To make my three problem areas more researchable, empirically speaking, I have broken them down into more specific research questions. The most general problem area - (1) – "how the nature and accessibility of production, reproduction, and distribution technologies affect the character of music production networks" - has been organized according to access, perception of change in network character, and involvement in related music activity spheres:

**(1a)** Is access to music production increasing with the diffusion of new technologies? If so, how? If not, what are the limitations on such decentralization?

**(1b)** How are musical production communities making use of personal computers in other activities related to music (promotion, communication, sales, marketing, distribution, visual design, etc.)? How does this inform values and attitudes toward technology and musical practice?

**(1c)** Are musicians in peripheral networks of production increasingly multitasking, doing more of the work involved in the 'production sphere' of music (including audio processing, promoting their music, designing CD covers, organizing live events and tours)? If so, what role do computer technologies play in this trend?

I organized the second problem (2) – "how the nature of production technologies affects conditions of creative work" – spatially, into three questions that address digital audio recording, roughly, in three distinct social environments (the studio, the band rehearsal space, and the home):

**(2a)** What is the impact of the digital audio workstation on working conditions in commercial recording studios for sound engineers and musicians?

**(2b)** What is the impact of the digital audio workstation on aesthetic decision making and creative processes among musicians regularly collaborating in groups? Does computerized recording encourage individual work over group collaboration?

(2c) How does the DAW affect activities in domestic spaces? Is work increasingly being done in the home? If so, what have been the consequences of this, both on work itself, and the domestic environment?

I operationalized the issue of "how production techniques, in large part constructed by the music software industry, reinforce categories of users within production networks" (3) in terms of how statuses of musicianship are constructed by both social interaction and the design of digital audio technologies:

(3a) Do attitudes toward computerized recording vary by class, gender, ethnicity, or music genre? What else informs musicians' attitudes toward and values about recording technologies? As well, to what extent is status in music communities reinforced via a gendered, racialized, and aestheticized social environment?

(3b) What limitations are experienced by "amateur", "semi-professional", and "professional" musicians and engineers working in digital audio software environments? How are these categories of "amateur", semi-professional", and "professional" reinforced by technological design? Are compositional platforms (emphasis, in use, of MIDI or audio recording) tied to specific aesthetic approaches, or economic limitations?

## 4.2. Methodology and Sample Frame

In late 2001 I began empirical research to explore these questions. I began with exploratory, formal interviews with musicians, and professional audio engineers. I then

developed a more elaborate methodological frame, including (1) more in-depth interviews with musicians and engineers, seeking personal and group histories of encounters with technology in music; and (2) a formal, planned participant observation setting (a DAW-based project studio in which several local bands were invited to participate, approximately six weeks in length).

Coincidentally, I ended up joining one of these bands (both on tour and in several recording sessions) as a synthesizer player a few months after the studio sessions were completed. The additional participant observation experience that ensued was so illuminating about recording practice that I felt it necessary to include that experience in this study (of course, not until after obtaining consent from the other band members)[11]. Through the use of laboratory, interview, and field settings, my empirical observations have evolved into a triangulated, qualitative glance at the practice of music recording, technology, and networks as experienced by residents of a production network based in Vancouver, Canada.

My sample frame within this network is biased toward the under-researched periphery (musicians in bands and solo electronic musicians who do not earn an income from their activities), and individuals whose livelihoods are potentially most disrupted by the emerging technological assemblage (audio engineers working in a range of studios, some paid well for their work, and some paid not-so-well). I selected both interview respondents and "laboratory subjects" (studio participants) to represent a range of backgrounds and exposure to computer audio systems. Of the five artists or bands

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[11] Though, reader be warned: this is not a document about wildcat excursions into poorly attended all-ages shows in small Californian towns. Nor is it about the horrific garden-implement destruction of the legendary House of Doom in Olympia. Nor does it recount the disastrous effects of the rather generous drink ticket policies at "that bar in San Francisco whose name I cannot remember". For these stories, look elsewhere.

involved in the studio, only three were well acquainted with digital audio software prior to their sessions. Two were extremely well acquainted. The other three bands or artists were novices in terms of digital audio experience. Of the twelve "interview-only" participants, only two were inexperienced with digital audio recording (notably, they were the two women interviewed, both of whom had primary experience in bands).

I attempted to recruit participants for the studio project with a balance of gender and ethnicity, but I failed to achieve these objectives. First of all, the (visible) peripheral "popular" music community in Vancouver is, seemingly, predominantly white and male. Secondly, resources only permitted me to enlist participation from a small sample (five bands), of which two (predominantly female, or female-led) bands dropped out of the research prior to their sessions. They were replaced by two bands from my "seconds" list, both of which were all male. In the end, only one female musician was involved in the studio sessions. Thirdly, being a white male with a background in Vancouver's independent music scene gave me more deeper and more convenient access to this community than to others (such as, for example, Vancouver's Jamaican music community). Time constraints on completing this research limited my sampling strategy, too. These factors skewed the sample to its eventual, male-dominated composition.

Interviews were more wide ranging, however, and the gender composition (while still unbalanced, also likely due to the gender imbalances in music and sound engineering) was perhaps more representative of peripheral music communities on the whole (to repeat, I interviewed two females and ten males for this component of the study). Ethnically, the picture was less balanced: all candidates were white, and of European origin. There are serious social issues raised by my difficulty in recruiting non-

white popular musicians in Vancouver, an ethnically diverse community. I have

personally known (and in a few cases collaborated with, for extended periods) several

Asian-, African-, and Arab-Canadian musicians in this city (though their numbers appear

relatively small, compared to the mass of white "popular" musicians in Vancouver), none

of whom were in town or otherwise available for participation in this project. The ethnic

homogeneity in my respondent and participant pool may be a shortcoming in this study,

although research into ethnically marginal music communities would likely bring with it

a number of theoretical complications that my "pop music and technology" research

orientation could not contain (within approximately one hundred pages). Future research

into local musical practices should deliberately seek out these "Other" communities

within local production networks. For now, I leave this task to those researchers who are

more suitably equipped to undertake such studies.


## 4.3. Interviews

Most (nine) of the "interview-only" respondents were interviewed in the Fall of 2001,

and the remaining three respondents were interviewed during the summer of 2002. Four

of the respondents were professional engineers (Howard, Shawn, Conrad, and Jasper),

two were "retired" engineers now working in digital audio instruction (Dave and Jon),

three were musicians who primarily worked in bands (two of whom were women)

(Wendy, Monica, Scott), and three were solo electronic musicians (Syd, Quinn, and

Kelly). All interviews were recorded on audiocassette. Informed consent was provided in

all cases on the original recording, at the beginning of the tape. At times, respondents

asked if the cassette recorder could be shut off for part of the interview, because some of

the details they wanted to provide me with had to be "off the record" (apparently, well-known core stream music producers keep their corporate secrets carefully guarded).

Two slightly different interview scripts were used - one for musicians, and another for audio engineers, owing to the variable relevance of interview questions for each. In the cases where respondents met the criteria for both of these categories, a hybrid script was used. The interview questions were rather open-ended in all cases. This encouraged lengthier elaboration and anecdotal digression in almost every case.

The interviews emphasized personal histories of musicians and engineers. I discussed with each respondent their experiences with different audio recording and sequencing techniques, their income and livelihood over their years as musicians, and the scope of the networks of musicians in which they have been involved. Interviews were mostly conducted in relatively neutral, semi-formal spaces (cafes, outdoor public spaces) to more formal settings (offices at SFU and the New Media Innovation Center). One interview was conducted via several iterations over email. Two interviews were conducted in respondents' home studios, each of which led to an informal observation session while they worked on music.

## 4.4. Project Studio Set-up and Observation[12]

It was not a showroom by any stretch of the imagination. In the early weeks of February 2002 I, with the help of a friend and his tools, installed a temporary recording studio in a 125 cubic meter chamber at New Media Innovation Center.

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[12] See the Appendix for a description of the hardware and software used in the studio.

According to legend, low frequency sounds tend to congregate in corners of cubic rooms. Low frequency sounds are also the number one source of frustration for those of us unfortunate enough to live next door to a sound recording studio. At high decibels, low frequencies are felt as tactile sensations in our bodies, churning our stomachs and rattling our cranial bones. Trying not to subject the tireless NewMIC employees in neighboring offices to these physiological effects, we took pains to construct "bass traps" – in our case, four eight-foot high wooden structures, each filled with a layer of soundproofing foam and a layer of air. They looked like carpeted coffins. To further reinforce the room, we covered one of the transparent walls with black plastic.

On testing whether the room was now soundproof, I found that a full drum kit still spewed its tones all around the building. Installing the coffins was thus a bit of a waste of time and money, then, I thought. Fortunately, I had scheduled all of the recording sessions for weekends, times when most NewMIC staff were not around.

The studio ran for five weeks. Five bands were recruited, each scheduled for a weekend: each was allocated two full twelve hour days and one four hour evening to record whatever they could. Throughout the sessions, my presence was not unobtrusive. I was a participant, though I was extremely careful to limit my involvement with what was going on with each musician or group of musicians. I would only become involved if there were serious technical obstacles (such as a computer crash), or if the musicians were completely baffled as to how to perform some function with the software or hardware). At times, it was necessary for me to click "record" or "rewind" for the musicians, at times when all present were engaged in playing their instruments for a single, simultaneous take. This should be regarded as a rather unobtrusive involvement,

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as the actions I was performing had little impact on the aural works being (composed and/or) recorded, and could have been performed by any other person unfamiliar with the hardware and software in the room. I insisted that all artists direct their activities during the sessions themselves.

After the sessions were completed in March 2002, I conducted group interviews with the five bands (PITTS[13], aLUnARED, Cielos, Audubon birds of America, I think therefore I can). These interviews were conducted using essentially the same scripts as for the "interview only" respondents. However, questions were modified so that respondents were directed to reflect on their specific experiences in the project studio, as well as including the "personal history" sought in other interviews.

## 4.5. Participant Observation in an Independent Band: aLUnARED

During the summer of 2002 I became a member of one of the bands who had participated in the project studio. This involved numerous live performances and rehearsals over the summer months, and also a two-week tour. As I have already stated, details of these live music endeavors are beyond the scope of this study. I am including, however, the experiences of recording in three different studio environments as a third prong of this research. I have structured my observations in this instance in the same way as it was structured for the project studio, using the same categories of observation.

Three separate studio environments were observed: a "remix" session at aLUnARED's home computer studio, a mixing session at a commercial studio for a finished full-length CD, and the complete recording process for a two-song seven inch

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[13] In respect of a request by one of the members of "PITTS", identities of both individuals and the group have been rendered anonymous.

record as it took place at a smaller-scale commercial studio. Only in the latter two cases was a paid engineer present.

<u>Chapter Five: Observations</u>

This chapter has been subdivided according to the typology of individuals I developed as my research programme unfolded: (1) audio engineers, (2) bands involved in the project studio, and (3) other musicians. The following is a summary of my observations of each grouping in terms of how my seven research questions apply.

## 5.1. Respondents with Commercial Sound Engineering Experience[14]

I decided to include engineers in the interview component of my study because of their unique perspective on the potential decentralization of music recording. Their jobs are, after all, potentially threatened by the diffusion of cheap home studio technology[15]. As well, they are individuals who possess the most technical knowledge about audio recording in all formats. As such, their contributions are invaluable.

Among all interviewees, the choice of sound engineering as a profession seems to inculcate a particular attitude towards technological change in the field more than any other factor in respondents' backgrounds. Commercial engineers were the most univocal and consistent group with whom I spoke. The six subjects I interviewed with backgrounds in commercial audio work differed from each other in that two (Dave and Jon) defected to academics and electroacoustic composition, while two more (Shaun and

[14] As this group is comprised of commercial engineers (and no musicians), not all of my research questions were relevant in their interviews. Specifically, because engineers occupy one position in the conventional mode of peripheral music production, questions (1b) and (1c) [dealing with multitasking in non-recording tasks] do not apply here. As well, (2b) and (2c) [internal band relations, and the culture of home recording, to which engineers are only partially privy] were not as relevant to this group. Question (3a) was also less relevant, dealing with musicians' attitudes as it does.

[15] a point not missed by the California-based HARP organization in the1980s, who, when confronted by a proliferation of home studios, challenged the home recordists' attempts to undercut them through legal intimidation (as recounted in Théberge 1996:233).

Howard) are presently heavily involved in lucrative commercial contract work, and the remaining two interviewees (Jasper and Conrad) run their own small recording studios.

Decentralization may or may not have serious consequences for the professional engineer, depending on the scale of studio the engineer works in. With the proliferation of cheap or free (demo or pirated) software systems, independent musicians do more and more of their production work themselves, without reliance on trained engineers and commercial studios. This 'DIY' ethic is nothing new, as Théberge documents, in the context of portable cassette-based home studios in the 1980s (1996:232). On the topic of the potential de-professionalization of audio engineering posed by the home based DAW, subjects in this class professed little disdain. While Dave notes that "it is not possible to make a living recording aspiring bands in a home studio...you used to be able to do that", he is also rather enthusiastic about the possibilities for the non-expert in the current wave of software development. Howard does not express any fear for his livelihood over the home DAW prospect: "while that area (the home based studio) may grow, there will always be customers who desire expert assistance and recording environments where they can just concentrate on performing". Shaun is quite enthusiastic in his agreement, noting that there is room for the amateur DAW user and the professional engineer in the same music industry: "that's what drives the industry, creatively speaking...kids in their bedrooms playing with sounds on computers...major label bands often try to emulate that sound".

Both Conrad and Jasper (who own their own small studios) are slightly worried about their profession, but have not yet felt the impact financially. Says Conrad: "more so than for my income, I fear that there will be a wave of poorly made CDs out there, and

professional standards will just drop...it seems that training in recording may become

less and less relevant if the amateur home studio takes off in a big way...that makes me

feel like I wasted a whole lot of money". Jasper agrees, and cites the expenses he incurred

in establishing a commercial studio: "these monitors, and that mixing board over there

still aren't paid off. By the time they are paid off, kids in their bedrooms will be using

plasma screen mixer interfaces and pirated Cubase programs, and there won't be any

market for my studio".

Since leaving commercial work for less time-constrained projects, Dave (like the

others in this category) favors the ProTools software platform over others for more

reasons than mere time-efficiency. He cites the company's range of "price points" (from

entry level, free versions up to expensive versions with multiple "digital ins and outs") as

one reason. This product line configuration (making ProTools, potentially, both a

commercial industry standard and a home computing product), he argues, enables a

limited democratization of audio work, in that home users, using the same virtual

environment, can more easily adapt to larger-scale recording situations should such an

occasion arise. He also points out that the product is deployed by a large, financially

stable corporation, meaning that "it probably won't go away any time soon". Howard and

Shaun both state a preference for ProTools - admitting their lesser experience in other

applications – as being also partially a direct result of both their professional training, and

the conventions established by commercial music companies. Jasper only uses a

ProTools-based computer system in his small commercial studio. Explaining this

decision, he rhetorically asks, "why should I waste thousands of dollars on a refrigerator-

sized tape machine when I could just spend that money on a good set of condenser

microphones? Most of the musicians I record wouldn't know tape saturation from radio interference."

While respondents in this category value new audio technologies in terms of how they increase the efficiency of commercial work, they also mention some of the minor technical complications that this can cause. As Howard puts it, "new clients will bring in demos recorded on incompatible formats" (such as MiniDisc), whose digital sampling standards are nearly impossible to match to those of high-grade studio recorders. Shaun, an engineer who works for labels such as Sony Music, pointed out that these situations are resolved through recourse to analog signal transfers between the two machines. This can create further problems: "There is some fidelity loss when doing this - going repeatedly through different AD/DA (analog-to-digital/digital-to-analog) converters...to the point where part of the original sound is unrecoverable".

Conrad emphasizes the importance of using analog recording equipment in projects he works on. He regularly uses 1/2 inch tape reels in order to obtain tape saturation, something which digital recording equipment cannot emulate very well. Conrad also made the point that digital audio equipment is not yet on a par with conventional recording gear, because " the signal bus is not nearly as refined...when audio signals are processed digitally, with software (especially in 16 bit recording), there is a certain warmth and roundness that is invariably lost". Obviously not a complete convert to digital recording, Conrad exemplifies a type of "analog purism" that seems common in independent music circles. Still, he uses digital equipment in his studio for the efficiency it affords in editing processes. There is, apparently, a quality of sound attributable to analog tape recordings that is impossible to achieve using digital

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equipment. Shaun, the respondent with the most frequent and lucrative contracts of all the engineers interviewed here, agreed with the superiority of tape over hard drives: "We usually go in and record drums first, and these are put on tape for the luxury of saturation".

Minor technical hurtles aside (none of the subjects involved in commercial audio designated these as "major" obstacles to their work), all six in this group talk at length about the timesaving aspect of digital audio tools. The commercial recording industry is a time-restrictive vocation, with brutish deadlines unlike those seen in academic or other not-for-profit work. Referring to choice of digital audio software, Shaun put this matter quite succinctly: "I use whatever software or format or plug-in that gets the specific job done the most quickly".

Shaun described several major structural impacts digital audio editing has had on the way music is recorded in commercial environments. They refer back to what seems the primary issue for commercial engineers – efficient time use:

> One thing to do is to get an *army* of people editing in another room, connected by Ethernet to the sound recording room, working on the routine processing at once, so by the time they're finished the *dirty work (of editing)*, the drums are mixed and transferred back to the main engineering room for mixing with new tracks…the assistant engineers most often do this sort of dirty work. (emphasis added).

The regimentation of work he describes here is enabled and intensified by the availability of digital technology. Another way that commercial music recording work has changed with digital innovations is in the division of labor between artists and engineers. Shaun notes that "artists now work less, while engineers work more…. artists come in and do one take that is fixed by engineers, whereas they used to come in and do take after take… the industry saying is that it's Slowtools, not ProTools". Hence, the digital replacement

(the copy-and-paste sound editing technique) of one kind of human work (playing an instrument) has consequences for the way the whole process is undertaken. Musicians are further divorced from the productive processes of their creative projects, while sound editors, who are paid substantially less than session musicians, are further involved in routine labor. Digital technologies are, as such, implicated in the further commodification of labor in the core stream of the popular music industry.

Despite these seemingly negative consequences of the digitization of audio engineering, I will repeat here that the professional audio engineers I interviewed welcome the timesaving effects that DAW technologies have in their work. In one case, the notion of learning and adaptation to changing technologies of work is assumed as "part of the trade". Howard, originally trained in analog-only environments, had to "upgrade (his) skills" on more than one occasion in the pursuit of work: "I basically had to learn the ins and outs of the O2R over a weekend in order to do a job in a digital facility". In another case, Shaun (who focused primarily on ProTools software while attending recording school) credits his specific adeptness with digital technologies for "opening doors" in his career path: "because (ProTools) was my forte, I was lucky... in that it became an industry standard soon after I started learning. I took on work that older engineers were less willing to do, and because of that, I earned a solid reputation". Overall, the commercial engineer seems more than willing to adapt to technological change in their practice. It is an assumed feature of their trade.

Particular insights about the nature of digital audio work processes come from the subject of education in digital sound technique, of which two of my respondents (Dave

and Jon[16]) are experienced. Jon got involved with sound production approximately five years ago, using analog equipment, in the context of an academic setting, carrying out radio documentaries and electroacoustic pieces. He has since adopted digital techniques in his own works, and taken up a position as a lab/teaching assistant in a university sound production facility. Dave has worked as an instructor in the same facility for several years. Their opinions on the impact of digital technologies in the classroom are markedly similar.

As Peter Manning argues, the central problems in the design of a computer-based graphical control interface for sound manipulation are that (1) "any representational system should relate to the experiential knowledge of the user, and the closer this correlation, the more effective is its immediate value" (1999:47-8), and (2) bonding the "control of the creative environment...to the real, analogue world where objects are physical entities, and where physical movements, especially of the hands, provides the most natural means of interaction and expression" (56). These problems manifest in the instruction of sound manipulation using DAW-based systems in several ways. The first problem is with the visual representation of sonic events (as, obviously, visual images are not the closest correlation to the experience of sound). As Jon points out, new students tend to spend more time looking for visual cues in computer monitors than they do listening for them in speakers. However, Jon believes that emphasizing "learning to listen" in a sound production curriculum effectively precludes this excessive visual bias. Jon instructs students that visual cues are an "aid to efficiency, but not something to be

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[16] However, because of time constraints, I had little opportunity to discuss issues of audio education with David.

relied upon". In and of themselves, however, Jon does not think that the use of visual representations of sound are "destructive to the aural work" that students do.

The studio Jon works in emphasizes complex tactile control surfaces (i.e., large mixing boards and tape machines) instead of simple ones (i.e., the computer keyboard and mouse combination), which partly solves Manning's "natural expression" problems. Still, Jon makes the point that "riding faders" (correlating sound information with the tactile control of a conventional mixing board) in his initial analog studio work was the most challenging skill to master. Apparently, the problem of tactile control surfaces in sound processing is not easily resolved as a matter of 'conventional PC interfaces versus conventional mixing board interfaces'[17].

Jon takes a strong position on the issue of use of the preset sound sample by students. He recounts a situation where a student presented a sound project "which was just an arrangement of pre-recorded, unmodified sounds". Jon places a high premium on learning to manipulate source sounds; as such, Jon perceived this student's project as "taking the easy way out". While he admits to having used preset samples himself in his own (pop music) works ("I used a drum and bass loop...but I tried to modify it so it would sound very different in my band's song"), he is rather wary of the current situation, wherein students have access to an enormous stockpile of pre-recorded sounds – via sampler CDs and the Internet – and are tempted to use this shortcut at the expense of a sound education in sound.

Overall, the commercial engineer seems more than willing to adapt to technological change in their practice. It is an assumed feature of their trade. The creation

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[17] Though, I return to this topic later, in reference to discussions I had with home-based DAW musicians.

of commercial musical works with the assistance of digital technology suggests a different distribution of skills among the members of a production team than doing so using conventional recording technologies. With newer digital technologies, it is more efficient for artists and musicians to keep their hands off the faders. In fact, it is more efficient (and less expensive) to transfer work that was formerly the province of musicians to engineering staff. Additionally, the work of processing of sounds becomes hierarchized among engineering staff, with the more tedious work of digital sound editing falling on the shoulders of the less experienced (or lower tier) engineers. The practice of commercial recording is further commodified in this way by the introduction of digital technologies.

Commercial engineers are generally not fearful for their jobs. They profess that there is room in the music industry for both a commercial and a non-commercial ('amateur') sector. However, one of them (David) noted that the days of the profitable home-based-studio-for-hire are now gone. Hence, the spread of 'DIY' DAWs (and the knowledge required to set one up) seems to have had a detrimental effect on only one part of the engineering profession: the entrepreneurial home studio owner. Contrary to some of the arguments I discussed in Chapter Two, commercial engineers are less worried about the DAW because it might actually *reduce* their competition for contracts.

This is a plausible assumption, but only insofar as it is a commonly shared belief among 'musician-consumers' that home-based digital audio workstations are not up to the task of producing 'professional quality' recordings. Indeed, this assumption also rests on another assumption – that aesthetic standards in a changing landscape of musicians will always privilege the "hi-fi recording". As both Dave and Jon pointed out, the

incorporation of the "lo-fi" in popular music has had increasing success. As Shaun

agreed, many high profile artists wish to emulate the sounds of "kids in their bedrooms

with computers".


## 5.2. Project Studio Observations

This section is largely based on the observation sessions conducted in the project studio,

supplemented by follow-up interviews, and further field sessions with aLUnARED. I

begin with a narrative description of each band's experience in the project studio, and I

supplement these descriptions with data culled from their interviews. I have organized

my observations of the project studio thematically (roughly, beginning with recording

environments, and widening out to data reflective of music communities or scenes). Not

all question areas applied to all artists. Each band involved in the studio yielded

observations that were weighted more or less heavily in one or two question areas. The

fullest data set was (obviously) obtained through my observation of and participation in

aLUnARED; hence, they appear last (as a segue into my discussion of "technologized

status" in music communities, and the potential fragmentation of local music scenes,

something that widespread computerization of music may pose).


## PITTS

PITTS is a two-piece improvisational group. They call their music "regressive music";

inspired by pop experimentalists such as The Residents, The Boredoms, and Onsen

Violent Geisha, they make a concerted effort to satirize popular music conventions. They

have never earned any money from making music, though they have been sporadically collaborating for the past 15 years, and released one CD in Japan and Canada.

The PITTS' creative process is rather unconventional for Western popular music (though it seems to be derived from a free jazz methodology). According to Mark (the "conductor" in PITTS), one member of the group devises song titles prior to recording (usually the night before), and the band improvises the songs while the recording device is running. Whatever occurs in their self-restricted time frame (the typical duration of a rock "album", about sixty to seventy minutes) is the "finished product". Their songs bear some resemblance to Western popular music, but their art is clearly one of demented spontaneity. PITTS employ (predominantly) gibberish vocals, and a random assortment of both automated and manual musical instruments, with the two members each playing more than one instrument at a time. They seem to try to sound as musically inept as possible, resorting to striking instruments in uncommon ways (with feet, mallets, and heads), designing their own strange instruments[18], and making purposive errors in moments of conventional instrumentation.

Only one of the members of PITTS (Carl) is adept with computer audio software, and has been learning Cubase for the past two years, working on solo projects. Formerly, PITTS documented their music with stereo cassette recorders. This was their first encounter with digital audio as a group. Carl, experienced as he is, controlled the computer, while Mark seemed to be interested only in getting on with performance – that is, making noise most horrible.

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[18] For this session the PITTS constructed (in the hour prior to recording)"baby bats": hollow plastic baseball bats with microphones inside. They wiggled these implements around, and whacked each other on the head with them, to make the microphones vibrate, producing a chaotically percussive sound. Later, they processed these sounds with significant amounts of reverb.

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I observed the PITTS record over sixty minutes of their music in about ninety minutes. The recording equipment was unobtrusive in the sense that one of the members merely started and stopped the computer between "songs". No multiple takes were made. The remainder of the PITTS' time in the project studio was not used. Carl took the data CDs home with him and mixed them on a computer using his own version of Cubase. I recently compared the rough mix I retained with Carl's finished mixes. Apart from some basic compression of vocal tracks, and adding reverb to the "baby bats" tracks, the PITTS mainly tried to make each sound audible in the mix. In other words, they edited their recorded music very little. This was as close to a "live document" that was achieved by any artist or group who participated.

In approaching the recording session at the project studio, PITTS expressed some ambivalence about digital audio technology. According to their vocalist/conductor,

> with the studio time, we wanted to waste the potential of the equipment we had available to us. We had never used such high technology before. Usually we recorded with cheap portable cassette recorders, using the condenser microphone. A lot of people use a lot of really expensive equipment, yet what they make with it is absolute crap. We wanted to emulate them. (Mark, interview).

Despite their "informed ambivalence" as a group, PITTS had a near-seamless recording experience using the digital equipment. Despite having to eliminate some pops and clicks produced by the MOTU audio interface (by resetting the sample disk buffer size, a two minute procedure) there were no hiccups in the endeavor. In fact, this performance seemed to take place without any attention to the computer or audio interface. They experienced one patch cord short, but this was with their own equipment (their bass guitar), and they "adapted" to this by adjusting a microphone to pick up a live signal directly from the strings of the instrument.

I get the impression that their off-kilter documentation habits are very much a part of their usual performance experience. Perhaps PITTS is not a good sample candidate for this study because of their unconventionality. Mark pessimistically describes PITTS as

> a metaphor for contemporary human beings and their engagement with technology and technique...reflecting how we are all just imbecilic organisms with some capacity to create rational tools or machines. But we are incapable of controlling them properly (i.e., the lack of musical skill evinced in our recordings), instead attempting to impose decadent conventions [their constant reference to pop music norms, such as the conductor shouting "okay, now, VERSE....now, CHORUS! (etc.)"] (Mark, interview).

Carl, the "song titler" for the ensemble, took the recordings home after the first night (on which all the recording took place) and worked for about an hour on one of the tracks, mixing signal levels, and scoping out possibilities. He reports no obstacles in this experience, and in fact reports this as "probably the best way possible to manage recording music", citing portability of both the music files (CD format as opposed to ADAT or analog tapes) and the software used (Cubase 5, which he has installed on his home computer) as the most "enabling" features of this scenario.

Both of the PITTS agree that digital technologies make their musical lives more efficient, but neither of them particularly cares about any possible advantages in using digital recording equipment (versus using a cheap tape recorder): "the one thing the computer does do for us is allow us to make MP3s and send them everywhere instantly. We like doing this a lot", says Carl. PITTS maintain their own website from Carl's home computer, but they do not engage much in online promotional activities like many independent rock and pop bands: "We just put it up there (on the website), and occasionally send out a mass email...not much, really", reports Mark. Referring to other uses (web design) of their home computers for activities related to PITTS, they cite

efficiency as the main positive aspect. On the negative side of things, PITTS are more anecdotally dismissive: "sometime my wife, she want to use the computer for porno art research, but if I give her a popsicle she don't complain too much about me doing the website", says Mark.

PITTS are overwhelmingly ambivalent about computerized musical technologies overall. Many of my questions were dismissed by them as "bourgeois", and not fully answered (particularly interview questions revolving around (1c, 2b, and 3b). They argue that technology cannot make any difference to how any group of persons interact internally (least of all PITTS), and that "if such seems to be the case with some band or whatever, then those people are nothing more than TV zombies, anyway, and should be wholly disregarded. And probably shot".

PITTS are equally dismissive of the relevance of musical community for the practice of any group of musicians. Mark argues: "I don't need a group of overly-tattooed underage kids coming to see our performances to validate what we do", coming out as an extreme autonomist about his "art", as he calls it. To my final group of questions – regarding "amateur" and "professional" divisions in music communities – neither of the PITTS professes to have any knowledge of what those concepts mean.

Overall, PITTS are still rather instructive, despite their facile attempts to hi-jack their interview to spout radical platitudes. They represent an extreme critique of the machinations of capital, in all its guises (including digital audio, which they use, but without paying for it, in an attempt to divest themselves wholly from the network of productive consumption). PITTS are less active as musicians (relative to others in this sample), in that their performance schedule averages about once per year, and they make

recordings at about the same rate. Theirs are not what I would characterize as "musical lives". Perhaps because of this, their attitudes toward computerization in music production are more informed by their experiences with technology more generally. As such, I am tempted to believe that the PITTS' experience confirms the idea that an individual's background with technology (particularly computers) is one highly influential factor in a musician's adoption and use of digital recording technologies.

## Audubon Birds of America

Next to PITTS, this was the least complex recording scenario I encountered at the studio. Audubon Birds of America (ABOA) consists of two members: Julian and Ben. Both of the members are very familiar with digital audio recording software, and both had experience playing in bands as well. This project, however, was not easy to pin down within such rudimentary categories. Ben and Julian use an assortment of synthesizers, effects units, sequencers, and contact microphones made from scratch. This group approaches the act of recording as a self-referential event; for their session, they used contact microphones to generate interference and feedback in the electronic instruments (which were also producing sounds) that they laid out on two large tables.

The recording media, as with PITTS, was left unobserved, except to stop the recorder between "songs". Unlike PITTS, however, ABOA approach recording without a clear distinction between documentation, performance, and creativity. Dialogue between the two performers was minimal (merely consisting of statements such as "that was pretty good", or "did you hear everything?" between takes), in a sense echoing the vast silences in their lengthy electronic pieces. Being very sensitive to their environment – and also

due to the fact that the sounds they were recording were so very quiet – they asked me to leave the studio while they were recording. As I needed to observe them, I opted to stay in the room for three full pieces, and to leave the room for the remaining two.

In an extensive interview with Julian, I learned the following. They are not interested in artifacts of music (static recordings), but in performance. Process is primary, and, in a much quieter voice, ABOA voices some of the same concerns as PITTS. "The specific technology used in music creation isn't exactly important or determining...I see it quite differently. Music, like any other human activity, is a reflexive interaction between mind and the environment it plays a role in constructing", according to Julian. Voicing a form of "Zen rationalism" in their approach, Julian and Ben revel in the art of mind, not of sound. We digressed from the script enormously. Said Julian: "if I were to design some purpose for my making music, then I would effectively alienate myself from the activity, and in effect I would be then doing something else, such as producing songs or artifacts of some kind...I'm not really enthralled with that sort of thing".

For brief moments during the interview, Julian and I discussed the economy of music making, but to a very limited extent. Julian's background in music has been one of borrowed equipment, informal, ephemeral collaborations, and no pursuit (nor expectation) of remuneration. Clearly, ABOA is a project that is almost entirely divorced from any "production network", community or scene. It is a private endeavor, resembling the utopian scenario announced by Jacques Attali in *Noise*:

> "The bulk of commodity production then shifts to the production of tools allowing people to create the conditions for taking pleasure in the act of composing. We can see – in the makeup of musical groups, in the creation of new instruments, in the development of the imaginary through the planning of personal gardens, in production using rudimentary tools – an

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outline of what composition can mean: each person dreaming up his own criteria, and at the same time his way of conforming to them" (1977:145).

In a sense, ABOA are living testimony (to bastardize Robert Johnson's expression) to an Attalian "crossroads" between a regime of replication (capital exploitation, accumulation and consumption of music) and one of composition (personal, non-audienced music), in which digital recording may play an important role. Using this interpretive framework, all of the artists involved in this study demonstrate the conflict between making music for one's own pleasure and making it in order to build an audience (a common ideological foundation of peripheral musical communities – that is, musicians assisting each other to build or expand audiences). I will return to this subject in my final discussion. For now, I turn to how other artists' views highlight this contestation of musical community – more forcefully, perhaps, and certainly with more emphasis on the decline of community and collaboration.

## Cielos

Cielos are a two piece band who can be described as "new wave indie country rock", or, as I find them, "music to roller-skate to". Ian (bass) and Andrew (guitar, vocals) are the principal songwriters and musicians in this group, and they have a revolving cast of additional members[19] with whom they rehearse for live shows, from time to time. This was the most organized team of musicians to come into the project studio. Both Andrew and Ian have extensive experience playing in bands, and Ian was part of a well known, constantly touring independent band in Ontario for some time prior to moving to

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[19] Post-script: Ian moved to Ottawa in summer 2002; Cielos is no longer together.

Vancouver. Ian's former band, at its peak in the early 1990s, was paying for itself at the time; but for most of Ian and Andrew's musical lives, music has been much more of an expensive hobby than a source of income.

Having extensive experience in both commercial recording studios and their own digital studio at Ian's home, the pair planned to record the bed tracks[20] for two songs in two ten hour days. This was their first encounter with a studio that consisted solely of a computer.

The Cielos recorded the two songs simultaneously, track-by-track. This seems to be a typical procedural rule in conventional recording sessions. The justification for this is that, normally, when a full drum kit is used, it takes several hours (sometimes several days) to position the drums in the room, position the microphones around the drums, and use equalization and filters to isolate the drum sound sources (because they are placed so close together in physical space). In some larger commercial studios, the drums and microphones may be left *in situ* for as long as the band or company has booked time. In smaller studios, the drums must be left set up until all of the drum tracks have been recorded to the band's satisfaction. And, conventions of distribution (recording a full "album" of songs) and economy (studios typically charge lower rates for longer blocks of time) dictate that more than one song should be recorded in a recording session.

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[20] "bed tracks" refers to drums, bass, rhythm guitars, and "scratch" (temporary/structurally guiding) vocal tracks. In pop and rock bands, this term connotes the assumption that songs have a foundation that must be established before adding decoration or color with synthesizers, backup vocals, and other sounds. A fitting analogy might be that of drawing outlines in a colouring book prior to filling in the blank spaces with colour. More than any other band that participated in this study, Cielos followed this procedural regime.

This procedure was especially interesting for the fact that Cielos did not use a full drum kit[21]. More likely, working this way became procedurally ingrained during their years of experience. Cielos' approach was more like "conventional band recording" than that of any of the other participating artists: their songs were extensively pre-arranged before coming into the studio, they positioned and re-positioned microphones for different guitar sounds, they used the "cut/paste/loop" technique as little as possible, and they tried seemingly-innumerable re-takes of vocal harmonies. In fact, their last day in the studio saw them dedicate about five hours to vocal harmony tracks. I can appreciate the fact that they intended to use the *space* of the studio to obtain raw sounds that they would later manipulate at their apartment-based studio. It would be impossible for them to experiment with louder volumes, microphone positions, or room ambience in their home environment in the way that they did at the studio.

Cielos' approach – tracking and re-tracking instruments, saving every recorded take, and leaving the digital sound processing and editing until later - proved to be rather byte-intensive. For a mere two near-completed songs, two CDs (capacity 750 MB) were required to store all the data. Were data-DVD players (capacity 4 GB) more common (or if Cielos had one on one of their home computer systems), I would have preferred to burn all of their data to a DVD.

I discussed with Andrew and Ian their experience of attempting to record in a conventional manner at a computerized studio. Their experience was overwhelmingly positive, and Ian mentioned with glee the results of transferring files to his home computer studio: "this was challenging at first, as I was using an older version of Cubase

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[21] Later on, they did spend significant amounts of time obtaining a guitar sound: situating baffling all around the amplifier, covering the contraption with a blanket, and experimenting with the positions of three different microphones.

on a PC, not a Mac...after simply changing the extension of the songfile, it imported to

my program beautifully...how liberating!" Evidently, they achieved everything in the

project studio that they intended to, reserving the procedure of mixing (more suited to

home based studios, as no rearranging of furniture is required for mixing) for their home

studio. This is a technologically influenced manifestation of what Théberge characterized

as a "mothership scenario" - referring to home MIDI studios of the 1980s, in which home

studios are used for preproduction before moving the project into a commercial studio

(1997:232-3). Instead, now, there seems to be a conceptual and procedural reversal, in

which the home is envisioned as the final mixing studio, while studios located outside the

home are best utilized for the initial recording of sounds (seeing that commercial

environments are better suited to making lots of loud noise than are home-based studios,

where there are neighbors and family members with whom musicians must compromise).

Cielos made it clear that their choice of technology for recording is based on cost

efficiency and control features. They perceived no difference in terms of their

productivity or satisfaction with results obtained in analog or digital recording. They

value the computerization of recording for all of the expected reasons: economy,

efficiency, control, and portability. Their love of the new technologies was not subtle. At

one point, Ian exclaimed, "long live the digital revolution!".

Cielos are a prime example of the potential for new audio technologies to

facilitate the continuity of former regimes of practice. Their "conventional" procedure to

recording transferred well to a studio consisting of merely a computer and an audio

interface. With only a slight revision in the former ordering of their practice (the reversal

of roles for the "home" and the "outboard" studio), Ian and Andrew continue to work

(still unpaid, but spending less money) in music, having adapted to the new technological assemblage quite well.

**I Think Therefore I Can**

I Think Therefore I Can (ITTIC) is a three-piece group: guitar and vocals by Dani, bass and vocals by Doug, and mouth-beatbox by Terry. For all (except Doug), this is the first band they have ever been in. This was their first experience in recording (apart from Doug's limited involvement in a prior recording project, for his previous band). They took an intense interest in learning how to record digitally, hopeful of its potential to cut costs for their band. ITTIC's experience at the studio was extremely informative. There was a distinct tension between their ambitions and their methods. This tension was amplified by the use of digital audio equipment, and the limitations of the audio gear used at the studio.

A preferred method for recording rock or punk bands is to record them "off the floor" or "live off the floor", wherein all musicians play simultaneously in separate rooms (or otherwise aurally isolated), and all of the performances are recorded at once. Most of the engineers and musicians I spoke to during my fieldwork agreed that recording groups of musicians is best achieved by using this method, alternately claiming that this is the best way to "capture" an "authentic", "human", or even "magical" performance of a band. For some, the authenticity of a recording of music seems to reside in intangible (and rather inexpressible) features of timing.

But conventional multi-track recording in popular music is a procedure that isolates individual performances into separate tracks. Typically, though, a final recording

consists of a mix of individual performances that never happened simultaneously in real-time. The consensus among my interview respondents is that in ideal circumstances, the whole band is initially recorded playing simultaneously. After listening to the original "live" tracks, decisions are made as to whether certain performances should be replaced. Typically, the simultaneous group performance is repeated until the drum kit tracks are perfected to the artists' (and engineer's, and producer's, if applicable) satisfaction. I did not inquire as to why the drum kit tracks reside in this privileged position for so many, though I assume it is due to several factors: (1) drum parts are typically the most rhythmically detailed (which means that potentially, more timing errors are possible), (2) drummers have a more difficult time hearing other instruments while they play (as their instruments are very loud, and the sound sources are very close to their ears (even penetrating the aural isolation of headphones), which is not usually the case for other, electric instrumentalists, (3) the commonly-shared perception that drum sounds are "foundational", or are the "bed tracks" of any popular song that includes them, "on top" of which are situated all of the other sounds, and (4) the time and labour-efficiency (mentioned earlier) of perfecting drum tracks before other tracks are completed.

The studio was equipped with only two sets of headphones for monitoring other sounds while playing. To avoid "track leakage" (the unintentional spilling of audio intended for one track onto another), then, no more than two musicians could be recorded playing simultaneously. ITTIC preferred to perform their songs with all three of them playing at the same time. Their cues for part changes, tempo changes, and time-signature changes depend on this performance situation, as they were recording novices (and hence not used to planning and isolating individual performances).

With my assistance, the group attempted at length to program Cubase's built in metronome to change time signatures and tempos according to the way their first song is arranged. Approaching the recording in this way, all band members could record their performances individually, and use both the computer monitor visuals and the metronome sound to guide their cues during the song. I observed that there was a tendency among the band members (and myself) to become distracted by the interstices of tempo controls in the computer software. This was a detailed procedure – the song in question consisted of two time signatures (3/4 and 5/4), and four discrete tempo changes. Four of the five hours was devoted to perfecting the "graphical mastertrack" (the automated tempo and time-signature controller in Cubase) for their first song.

Next, the attempt was made to have Terry (the mouth beat-box player) perform his part along with the metronome track. He made a few unsuccessful attempts at this on his own, but eventually Doug was employed to play bass along with him. Three different methods were attempted in recording this track: (1) using a direct signal from a microphone, into which Terry mouthed the rhythms, (2) using a line signal from the small, 10-watt amplifier he usually sang through, and (3) positioning a microphone in front of the speaker of his amplifier. The recording of this single track of beat-box was finished on the first night.

The first two hours of next day were spent experimenting with the equalization and compression on these tracks. Terry and the others were surprised that the tracks did not sound as they had expected; I attribute this to their unfamiliarity with recording. Eventually, they decided to use the direct-recorded track, albeit with significant tweaking of equalization and compression.

Next, Doug and Dani tracked their bass and guitar parts, respectively. Their unfamiliarity with playing along to previously recorded tracks was evident; numerous re-takes were necessary for them to perform to their own satisfaction. The last two hours of the second day were spent tracking parts for a second song. It was at this point that I realized that they had been expecting to get much more accomplished during the weekend than they were.

Their last day of recording involved recording additional guitar tracks and vocal tracks. Seeing their time running out, ITTIC reverted to recording and further refining the tracks of their first song.

Dani (notably, the only female participant at the studio) demonstrated much ambition by taking the reins of the recording software early on. Being a graphic and web designer vocationally, it seemed that Dani's skills in other computer applications transferred well to the audio software. As her case is directly implicated in my discussion of musical communities and multitasking, I reserve my comments in this domain to my later section dealing with this subject specifically.

At the conclusion of their sessions, ITTIC expressed concern that they had not achieved everything they had set out to do, and were worried that I would be disappointed with this. I reassured them that all of this was about learning (mine and theirs), and their contribution to my study of music practice was invaluable, as they were the only participating band who was inexperienced in recording. I reassured them that I had admired their ambition and willingness to learn while recording. Still, I was left with the impression that they perceived themselves as "amateurs", and that computerized

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recording knowledge was a barrier in this regard. As I point out later in this discussion, this perception resurfaced in my interviews with female musicians, particularly.

Overall, ITTIC was highly instructive in terms of barriers to learning about recording in a computerized environment. I noticed a tendency for the musicians to rely more on visual cues than to listen (confirming Jon's comments about audio education, mentioned earlier). As well, the division between performance and "performing in a recording session" was in sharpest relief with ITTIC. Their music had been entirely written in a "band rehearsal" situation, and was tailored specifically for the intangible timing peculiarities of musicians in such scenarios, involving bodies in motion, and perhaps, the subtle interplay of body language to keep the group in time. Seeing that their "rhythm section" emanated directly from a human organ (and not from a manufactured percussion), I believe that this problem was more pronounced for this band. I can only speculate (as the influence of body language and interplay of musicians in the timing of music is an under researched field) that syncing live music to a computer's click track presents challenges to musicians that are usually overlooked in the interest of "making it work".

**aLUnARED**

Last, and certainly, not least, the story of my ongoing relationship with the band aLUnARED is extremely illuminating, especially in light of questions (2a), (2b) and (2c) [relating to conditions of creative work]. As this story unfolds, much of my observation may become clouded by my active participation in the band. I tried at all times during my involvement with the band to be both an observer and participant. I claim no objectivity

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of any kind, obviously. I have, however, endeavored to provide as *fair* of an account as possible to all parties involved. Participant observation has the advantages (over other research methods) of (1) depth and richness of data, and (2) insight into unexpected events, resulting from the immersion of the observer as an "insider" of the group under observation. Its primary drawbacks – reliability and generalizability – mean that the results must be read carefully, and with qualification. An additional risk is that a candid account may offend or embarrass some of the individuals who appear in the story. I have prepared this portion of the report in collaboration with most of the members of aLUnARED, and these negotiations have resulted in a narrative that balances their interests with mine, and only minor exclusions have occurred. There are two major examples of where this endeavor has compromised the results I am able to report. First, identities of individuals in this story for whom no formal consent was obtained (such as studio owners and engineers) have been substituted with pseudonyms, and many (though not all) of the details about personal matters relevant to the dissolution of aLUnARED have been omitted. Still, it is a rich experiential narrative, suggestive of tentative answers to many of the research questions I originally set out.

aLUnARED is a four-piece "electropunk" band based in Vancouver. They have been performing and recording for three years, and have released two full length CDs, as well as a number of singles and remixes in both Canada and the U.S. They have toured twice in the U.S., and have recently been signed to an independent record label in Ohio (Action Driver). Still, like PITTS, they have spent far more money than they have earned while working in music.

When they came in to record at the project studio, they were in the process of recording a full-length CD for release by Action Driver. The bulk of their recording was being done at a local recording studio. According to Jack (vocalist and principal songwriter in the band), the studio in question was of the "small business" variety: located in an inexpensive, residential suite, managed by two individuals, with cheap rates, and a rather unreliable, "open" scheduling system. While the label's funding of this recording made things a little less stressful for the band (in contrast to their first CD, which the band paid for themselves), the scheduling practices of this studio made it difficult for the band to book time. Jack reported that the band's previous CD took them two years to record at that studio because it was so difficult to arrange time slots during which the manager (also the sole engineer employed there) was available or willing to record them. Seemingly, the studio in question is not a "commercial" studio in the strict sense of the term, but is rather somewhere between a "commercial studio" (in that it charges money) and a "hobby studio" (in that the studio has already paid for itself, and the owners are not in the business of recording solely for profit), something of a labour of love.

When aLUnARED arrived for their initial evening session at my project studio, I was wary of their recording techniques, as the studio was not outfitted for MIDI sequencing (which, I had mistakenly thought, the band uses for both recording and live performances). When they started setting up their gear - without a MIDI cable in sight - my fears were put to rest.

aLUnARED took their session time as an opportunity to create a new song. They began with drum loops (recorded from a live drum kit), which were laboured over for

about five hours. They experimented with different microphone positions around the room. They recorded numerous retakes. They brought in metal cans and miscellaneous implements, and used these to record additional percussion tracks. As this was an instance of composition-during-recording, the three band members present took their time experimenting, listening to what was just recorded, and communicating with each other about what direction the song ought to take. Eventually, three different rhythm patterns were looped, and strung out in three separate, five minute long, rough song sequences. I burnt an audio CD for them at the end of the first night. The vocalist took this home with him so he could generate more ideas, and write some lyrics.

Only one member of this band, Graham, was proficient with Cubase, and he took control of the computer interface on the second day. With time constraints in mind, they decided to focus on one of three drum loop sequences rather than all three. With Graham at the computer keyboard (and the others looking on, constantly conversing about what modifications should be made), about five hours were spent experimenting with different reverb, echo, and compression effects. Eventually they decided to "print"[22] these tracks (with echoes and compression) to new tracks. Throughout the proceedings on the second day, Jack (the vocalist for the group) periodically retreated from the computer screen to the back of the room, writing song lyric ideas down in a notepad. At the end of the day, I burnt a second audio CD at Jack's request, so that he could further work out song ideas at home.

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[22] Signal processing effects consume significant amounts of computer processing power, degrading multitrack audio playback performance. Thus, musicians familiar with DAW environments know that every so often, in the process of recording, certain effects must be committed to certain audio tracks before further processing functions should be performed. This, in some respects, restricts the way a DAW recording is made.

They returned on their third day to add new ideas to the sequence they were working on. This day was spent recording new audio tracks: four vocal tracks (one of which consisted of blood-curdling screams, much to the annoyance of the unfortunate NewMIC researchers who had chosen to work in adjacent rooms that day), two synthesizer tracks, a guitar track and a bass track. This session lasted ten hours. By the end of the sessions, aLUnARED began some rough mixing at the project studio.

All three of the members of aLUnARED at the time (Jack, Bill, and Graham) had prior recording experience (both analog and digital, commercial and home, solo and in groups). However, as with PITTS, only one member of aLUnARED had experience in digital audio software (Graham) at the time they began their sessions. During their session, this member was designated the task of manning the computer, while the others performed and contributed verbally. This group spent a significant amount of time editing. Regarding this, they remark that the experience with computer-based recording was not much different from recording in commercial studios. Says Graham: "it's more enabling to be able to work partially from home, and then bring stuff you've worked on there into a studio...you save time and money". Jack argues, however, that he prefers to write music playing live in the band's practice space, agreeing that he finds writing music at home to be rather "lonely". As to the differences between conventional recording studios and computer-based studios, they are all in agreement that a larger control surface is more amenable to active group participation in mixing; as Jack says, "sometimes you need more than two hands riding the faders".

Graham's background in music consisted of equal parts "guitar playing in punk bands" and MIDI sequencing on his computer at home. Jack's background consists of

extensive experience in live bands and commercial studios, and his interest in computerized audio essentially started with aLUnARED's sessions in the project studio. Bill was just in the process of buying a computer for the first time, but his vast experience with MIDI interfacing and both analog and digital synthesis are something of a preparation for programs such as Cubase[23].

The transformation of aLUnARED - from a band mainly reliant on cheap commercial studios to a much more self-sufficient, digital recording entity – actually coincided with my entering the band as a full time member in June, about four months after their sessions in the project studio concluded.

Prior to the official invitation to join the band, I was asked to help them record and master some remixes for an upcoming release. In this case, all of the composing and initial recording had been done previously at Bill's house, using an old Tascam cassette 4-track. The final mixing, with which I assisted, was done using one of the band members' computers. This was a lively and dialogue-driven experience, in which each member (now somewhat familiarized with software recording) took turns at the computer terminal in various stages of mixing and mastering. Says Jack of this experience: "it's really quite amazing (with that record) that what started out as a cheap 4-track recording became so controllable in terms of sound quality when transferred to a computer format". The band has actually never been more prolific (in terms of quantity of recorded output) than they were in 2002: one full length CD (*SLMZK!*[24]), and two singles ("Anthem"/"ELKTRK!"; and "Blood and Muscle"/"SLMZK!" [remixed] were released

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[23] In the interval since their studio session, Bill has adopted quite a complex computer-based studio set-up in his basement at home, and reports much enthusiasm for this change.

[24] Pronounced "soul music".

by this band over the course of the year. Their previous CD (*The Death Birds*) took a full year to record and release. The partial computerization of their recording habits was one of the direct causes of this phenomenon.

But aLUnARED does not employ computerization in their practice as a sole means of recording, as the members of the band continue to value and use commercial, analog tape based studios for their label-funded projects. After the remix session, they asked me to join as a replacement for their fourth member, who had recently quit to pursue other music projects. The first recording session I attended with them was at a small, commercial basement studio. Most of the tracking was already complete, and what was left to do involved mixing, which is, according to Ramos (2000), the most privileged of all processes in music production: where sound is shaped and permanently fixed and inscribed in distributable media. In this instance, five persons were in attendance for about four full days: Jack, Bill, Graham, myself, and the engineer (Craig), each of us with opinions about how things ought to sound. On this occasion, Craig kept quiet most of the time, acting more as a guide to the signal paths in the mountains of gear in his studio. Craig spent most of his time doing editing tracks without input from the band on his computerized interface (a 24 track proprietary system).

In this scenario, the division of labour was very clear-cut: the members of the band would remark on where certain sounds should "sit in the mix", and Craig would manipulate his equipment to achieve these aims. Bill reflected on the situation afterward, and made this observation: "I asked Craig what he thought of the final mix, and he mentioned that the drums needed some work. I asked him what sort of work, and he replied, 'if you can't hear it, then maybe there's no point'. I think he was afraid to voice

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his opinions". As well, the situation was structured by the technology in the studio. None of the members of aLUnARED were familiar with the proprietary recording hardware (not to mention the particularities of Craig's studio equipment). As such, there seemed to be an impassable divide between music composition and music recording. Several members of aLUnARED have expressed that this is problematic. Both Graham and Bill, who seem to enjoy the manipulation of sounds above all else, view this division of labour (which they indeed perceived) with mixed opinions. Said Bill: "I'm not sure the convenience of a hired studio and hired engineer is worth the expense, especially seeing how they tend to take over the role of sound designer". Said Graham: "it's better to work with an engineer who likes and understands your music. When they like your music, they're more likely to voice their opinions, which can be helpful, but which the band can always veto".

The next recording venture I attended with aLUnARED took place in a fully computerized ProTools based scenario. On this occasion, I observed (and participated in) a complete recording session from start to finish. The engineer, James, was an extremely lively and enthusiastic member of the production team. Additionally, the familiar WIMPS interface was the center of editing activity, and James invited the band to avail themselves of the controls as they wished. Most of the time, however, James himself was in control of the equipment. The band conceded this role for two reasons: (1) James' efficiency at editing and mixing tasks is much higher than that of any of the band members, and (2) sufficient dialogue took place between the band and the engineer. I cannot emphasize the importance of dialogue between band and engineer enough. Compared to the band working alone in the project studio, the rate of recording and

mixing in James's studio was approximately double, and significantly faster than at Craig's studio.

An important aside to the experience at James's studio is that two members of the band (myself and Graham) performed pre-production on five tracks of audio at our home computers, prior to the paid sessions with James. aLUnARED uses both electronic and acoustic percussion in their songs. Graham sequenced the electronic percussion at his home. I elected to try recording my synthesizer tracks at home as well. Two days prior to recording, Graham sent a large file via FTP to my computer, which contained his percussion arrangement. I burnt these to a CD. Then I copied the audio files into a Cubase song file, and added synth tracks. I deleted his original drum tracks, and then exported my synchronized synth tracks to a separate audio CD. Upon entering James's studio, these tracks were imported into his ProTools system seamlessly. We had come into his studio with half of the work completed prior to even plugging in any cables.

Computerized audio recording allows the work of production to be diffused in the manner I have described above. As I discussed with sound engineers, pre-production by artists or bands is not always a productive venture. As Shawn pointed out, artists bringing in their demos on incompatible formats (i.e., MiniDisc) can often create more time-consuming problems than it can alleviate. With appropriate planning, and effective communication between engineers and musicians, however, the diffusion of recording tasks into the home can be rather beneficial to all concerned.

However, this "remote recording" scenario brings problems of its own. With the success of this venture, the other members of aLUnARED started showing up at my small apartment to demo new songs more often. As I do not live alone (I live with my

girlfriend and our cat), my domestic sphere began to feel the effects of this restructuring of aLUnARED's creative work. Most importantly, a confusion of leisure and work has occurred: aLUnARED has begun to break even in its budget, and because of this, in a sense, composing and recording music (which for me used to be more of an unpaid, leisurely pursuit) has become work, bringing with it deadlines, some stress, and a monopolization of the computer facility in my home. Much to my cat's annoyance (he hates aLUnARED), and my girlfriend's feeling that she should not be here when aLUnARED is recording, working in this band has proved itself potentially disruptive of domestic organization. While I enjoy the idea that the music we create in my home is distributed all over Canada, the United States and Europe (and has been receiving positive reviews in some areas), downtime is becoming scarce. As such, in the present author's situation, a retreat to more conventionally structured recording regime (involving a studio outside the home, and scheduled times of work) is desperately warranted.

I have one final note regarding the recent fate of aLUnARED. Bill and Graham recently quit. Their departure was on good terms, and there were many reasons for their collective decision (including differences in aesthetic vision, money issues, and their involvement in another recording project called Droom). I cannot help but observe, however, that part of the reason had to do with the regime of creative activities in the band. More and more, the band was gathering at individual members' homes (Jack's, Bill's, mine, Graham's, which are rather far-flung in three different cities) to sit down at a computer and write and arrange songs together. Not all members could attend all of these sessions.

However, when the band would get together to rehearse for live shows (at a relatively central, more neutral location in Vancouver's downtown east side), the main concern became one of learning synthesizer and percussion arrangements pre-composed on a CD. I will admit that both Jack and I are more accustomed to conventional modes of music composition in the "pop/rock" idiom. We are more accustomed, that is, to "jamming" in a rehearsal space, collectively engaging with the tactile interface of instruments, making collective decisions through active dialogue, and the immersion of our bodies in the machinations of sound production. As more and more of aLUnARED's composition practices moved onto our hard drives (and into our individual homes), collaboration dissipated in the rehearsal space, replaced, as it was, by robotics. Jack and I would occasionally venture into experimenting and writing music in the "jam space", and Graham and Bill (less experienced with writing music in this way, as their backgrounds in music are more synthesizer- and computer-oriented) felt hard pressed to contribute in this context. Moreover, the troubled dialectic of "rehearsal space" and "computer space" was a likely factor in the dissolution of the group.

To me, aLUnARED exemplifies almost all of the sources and expressions of conflict experienced by musicians in their confrontation with the computerization of musical processes. I have observed this band for over a full year, and I have witnessed the impacts (both positive and negative) of new technology in their creative regime: increased efficiency and productivity, diffusion of creative activities out from former spaces of work, and the fragmentation of social relations within groups as a partial result of increased computerization. I have a few more observations regarding aLUnARED - relating to questions (1b) and (1c) [dealing with computerized nonmusical activities in

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music production communities] and (3a) and (3b) [technologized and socialized status]. I have reserved these for my section (below) on the impacts and potential for computerization in musical scenes.

## 5.3. Other Musicians

I spoke with six musicians who were not participants in the project studio (Syd, Quinn, Scott, Kelly, Wendy, and Monica). Three of these subjects are electronic musicians who work primarily alone (Syd, Kelly, and Quinn), while the other three engage in band-type projects in addition to solitary home based digital work. Their relationships to technological change range from the 'conservative resistor' (such as Kelly, Wendy, and Monica), to the 'visionary adaptor' (Syd or Quinn, who talk an awful lot about the future), to the aspiring 'participant' (Scott).

While there is a mild tendency among some (Scott, Quinn, and Syd) to fetishize "high tech" recording equipment, there is an apparent consensus among them that practical (i.e., space, money) limitations on their equipment needs are acceptable limitations within which to work. In discussing their histories, many home DAW-based musicians report that there was a point where they stopped consuming new technologies. Kelly, who still uses an old (c.1990) Atari computer as his main MIDI sequencing device, reports: "I prefer my present setup over new software based sampler/sequencers for their stability. PCs are prone to viruses. Samplers aren't. The all-in-one 'solutions' aren't ultimate answers...I have enough gear to do what I want". It is as though there is a saturation or break point in the construction of a home studio, at which point, artists become content (or rationalize contentment). Wendy also values the simplicity of her

home studio, which consists of an eight-track cassette recorder, with some added MIDI sync capability. These practical limitations inspire her to work in a more directly "goal-oriented" way, in contrast to more high-tech scenarios, in which her work has seemed "stunted by the limitless options". Syd makes this point as well: "One of my rules is, keep it simple...know your own system inside and out, despite its limits".

Despite his practical conservatism about his present studio, Syd, like other subjects (Quinn, Scott), is not averse to imagining future possibilities. When queried on this topic, he describes systems of interface involving direct cognitive control of a musical instrument:

> My idea is to have an interactive brain thing, that translates your thoughts into sounds...There's times when I have these lucid dream states, and I get these sounds, where I wish I could record them...but on the other hand, I guess the challenge wouldn't be there anymore...the challenge of making these sounds. It would come too easily...if you could instantly make sounds, and you could instantly make rhythms.

Quinn has similar fantasies about the use of virtual reality in digital audio applications, in which his "bodily movements could be scriptable for audio processing functions".

Such futuristic fantasies are not uncommon in the largely technophilic subculture of electronic musicians, but technophilia seems to influence DAW musicians' opinions in other ways, too. Scott's fondness for Cubase (and other programs that seem to him "more accessible to everyone") informs his ideas about the democratizing effects of technological innovations:

> I think that large companies like Digidesign have designed their products in ways that prohibit the amateur from getting involved in music production...it was only a few years ago that they introduced a free demo version of ProTools, long after Cubase was already available, ...(Cubase was always) cheaper to purchase, and usable on inexpensive computers.

Scott points out that Cubase is partly "open source" software, as well, which allows users to write plug-ins and other bits of code to customize their working environments. He is actively trying to learn how to do this, in order "to take control of the machines" he uses for musicmaking. Scott sees the current situation of computerized popular music as follows:

> The timing of a number of different technological developments couldn't be better...the Internet, MP3 files, peer-to-peer networks, the Open Source movement, and the widespread sharing of pirated audio software...a major shakedown of the mainstream music industry is about to happen, and it's important for independent musicians to get on board now, before some corporate-driven mechanism for controlling these comes into play.

This technophilic attitude among some home-based DAW users leaks into the way they approach the performance of music as well. Self-deprecatingly, Quinn remarks, "I trust the computer more than me" to put in an acceptable performance of music. He would rather automate his sound generation, compositions and mixes than spend time recording live audio signals. In fact, his ideal modality of interface is rather unconventional for an independent pop musician: "I would rather input sounds mathematically, algorithmically" (like numeric x/y axis-type editing, already available in programs like Photoshop). This, he says, "would enable scripting for routine operations".

This brings me to the question of automation and the use of presets and prerecorded sounds in independent music recording. Scott and Quinn both concur that in the production of pop music, there are many standard routines that are better stored in a preset settings archive. Scott immediately says" vocals compression" in response to this query, explaining that he always wants to achieve the same dynamic range for recorded human voices. Quinn favors the idea of preset EQ and effect settings, but only "presets that I have come up with myself". I observe in this an interesting point about independent

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popular musicians (at least the ones I have interviewed): while subscribing to a 'DIY' ethic in terms of practice and production tools, they generally prefer to compose works according to a set of standard formulae (with only a modicum of variation). Going back over my interview with David, the defected commercial engineer, I realize that he has made the very same observation:

> I saw pop recording as a very standardized creative environment. The aesthetic standard in pop audio is that bands come into a studio wanting to emulate sounds of established artists...(in contrast)... electroacoustic music doesn't have such standard models – it's more about the process itself... Sounds are isolated, processed, and then mixed in the pop convention. The notion of performance is often lost in these 'commercial' recording environments.

Another interesting conflict is evident through close observation of independent DAW-based musicians, in terms of their use of presets and sampling. While nearly all subjects in this category use sampled sounds extensively, those who do so qualify this with the argument that they extensively modify the sampled sounds they obtain before doing anything with them. Kelly and Syd both state (in almost the very same words) that most of their studio time is spent manipulating samples. Quinn and Scott also do this (but for some reason, they each claim to spend far larger amounts of time sequencing and mixing than they spend in source-sound processing). Differing substantially from the pack, Wendy reluctantly admits to using sampled drumbeats, but "only in the experimental phase...of writing new songs". Syd considers it a "faux pas" to use a sample that some other musician or engineer has labored to produce. Scott merely thinks of it as a way for the creatively impoverished to make music, referring to "commercial radio's plunderous shit-pile" of retro-sampled hit songs.

Not one of the musicians in this group works in a ProTools software environment. One uses SoundForge, two use Cubase, and one uses Cakewalk (Wendy and Monica, again the exceptions, use none of these). Wendy's home setup is not a DAW. She has, though, "dabbled in Cubase a bit"). Present choice of audio platforms seems directly tied to their initial introduction to that platform; all of the musicians I spoke to mentioned that they intend to stay with one platform, as they have invested years of their lives learning them. The majority of them (with the exception of Kelly) use as a primary interface the keyboard-and-mouse combination (Kelly interacts with his machines by mainly using the touch-pad controls on his digital sampler). As such, their 'performances' of sounds is limited to step sequencing and copy-and-paste (click and drag) editing. All of the musicians in this category claim to spend less than a quarter of their studio time actually playing a musical instrument.

Among the musicians in this group with some background in commercial recording settings (Scott and Quinn), there is a unanimous disdain for the whole process. In particular, they expressed severe difficulty with (1) cost and time constraints, and (2) communicating about sound with professional engineers. Scott recalls a rather harrowing introduction to commercial analog-based recording:

> My band had four days to record and mix four songs. Under the literal 'direction' of the studio's engineer, we spent the entire first day, and half of the second day watching - listening to him fuss over the positions of drum mics...at one point I counted 20 mics on the drums...the rest of that day was spent recording other tracks. We were informed that one of the songs was totally 'unusable' because of some barely perceptible tempo drag in the drums. Another full day and a half was spent mixing and compressing the drum tracks. There was so much sensitivity over whether or not to "commit" the drum tracks to tape, as we were limited to 24 tracks, and prior stages of recording were destructively lost in this analog process...at one point the mixing engineer asked us to leave the room so he could 'concentrate' on the drum mix. The whole time, I felt like

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throwing these 'professionals' out of their studio and firing up the old Roland beat-box.

Quinn recalls a similar scenario:

> I spent three days in the studio waiting to record my guitar line. I got three takes at it before the engineer insisted on moving on to "fattening" the sound with synthesizers...overall it was very frustrating.

In both of the above cases, a conflict of aesthetic preferences between musician and engineer resulted in what the musicians perceived as a "waste of time". The engineers, in their defense, were probably doing what they were usually asked to do: achieve "radio-friendly" sounds. Despite his bitterness over the wasted money and time, Scott can still see that this is probably true: "I suppose we should have made it clearer that we didn't want to sound like that from the get-go, that there was no need for such a fuss". Nevertheless, the aesthetic expectations of artists and engineers who are both used to working in very formulaic (but in each case, very different) ways do not always match up, resulting in such conflicts. The DAW studio, at the very least, offers a viable (though more labor intensive) alternative to this conventional model of recording popular music.

But this alternative mode of recording, like much of musical activity, is socially mediated, with often exclusionary consequences. The two women interviewees here (Monica and Wendy) both made statements to the effect that digital audio recording poses specific challenges for women musicians, based on the ways males tend to construct recording (and other musical) situations. Wendy's recording experiences have been typified by "boys working the machines", as she explains:

> I've always been in situations where I just sing and play my guitar parts (for recording), and my involvement during mixing has been limited...partially due to time constraints, but also because the men I've worked with in the past have usually had prior knowledge of the

equipment being used...in some ways it's just more convenient to let them twiddle the knobs, though I prefer to do this myself, on my own.

Wendy played in bands for several years before gravitating toward recording music on her own. She always played in bands with males; always, she was the vocalist. Currently, she records her own music, but has not made any plans for purchasing a computer system for this purpose: "my 8 track machine serves me well...I achieve what I want with it".

Monica's experiences in recording music exemplify some of the problems of gender exclusivity in independent music scenes. She has been involved in three different bands over the past three years: one entirely composed of females, and two with an equal balance of males and females. Monica recounts how, in one of these groupings, her voice was drowned out during recording sessions:

> Basically during the whole time of recording (a conventional analog tape-based studio), the engineer addressed all questions about how parts should be recorded, and other aesthetic decisions at our guitar player, who was a guy. By his own admission, our guitar player knew fuck all about recording...but the engineer seemed to assume that it would be him that would give him the answers that he needed.../

Her opinions on the computerization of recording are inseparable from those regarding the wider gendering of musicians in band scenarios:

> I don't know anything about digital audio, nor am I particularly interested in learning about it. I first got involved in music as a kind of "social practice" in the mid90s, around the time of the Riot Grrl movement, when women (widely) began to learn how to play electric guitars and so on...so you were making a kind of political statement, but there was also this culture of fun around it. So the idea of sitting at a computer all day, by myself, diddling with knobs, doesn't seem all that appealing to me. It seems like a different sort of practice, one that I don't see a lot of punk or indie women being terribly attracted to, because of the way they got involved in music in the first place...I don't think that women will never be interested in digital audio. I've noticed that younger women seem to get into it more than women in my age group. I would guess it's because they were more heavily educated in computers at an early age?...even so, the women I know are usually more interested in playing music, writing

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songs, and developing a concept for their band...digital audio seems to be a necessary evil, but they do it anyway.

Monica makes the insightful point that computerization adds an additional 'exclusionary layer' to the practice of music, which was already a 'boy's world' to begin with:

> It was hard enough picking up an instrument when you're almost an adult and learning to play well enough to play in a band with guys and to gain their respect as a musician...now it's like there's this whole other layer of stuff you have to learn in order to establish your credibility as an indie musician. I would be perfectly happy just working with an engineer who was polite, respectful, and aware of the fact that 'women in rock' is not some new, weird, alien phenomenon. I wanted to hire a female sound person, to do sound (for the band that was entirely female), but no one like that ever crossed my path.

Still, during Monica's musical life, there have been exceptional moments, few and fleeting as they may have been:

> in my 'girl band', we did one recording session, live on campus radio. The engineer, Evan, was hilarious. I think he was too stoned to be sexist even if he wanted to be. But he made us sound really good. In fact, one listener called into the live show and said, "until the vocals came on, I thought you were the Misfits". In the interview part of the show, they asked us some really dumb questions like, "can two redheads really get along in one band?", but the actual live recording part was really fun.

If Monica and Wendy's accounts are widely applicable, gendered socialization of technology, then it is clear that computers, like music, are socially mediated in a gender-biased manner. Women in music may be subject to increased exclusion from musical domains dominated by males (at least in the case of my two respondents), partially as the result of a possibly gendered diffusion of a computer recording software.

According to a 1994 survey, the majority of music software buyers were 90% male (Théberge 1997:229). Part of this problem may be addressed in the creation of "safe spaces" for women musicians and engineers, outside the wilds of independent music scenes, as exemplified in Sandstrom's account of women's sound engineering festivals

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such as WomanSound (2000). Others (Barry Truax, personal communication, 31 March 2003) have suggested that the traditional male bias of enrollment in audio technology training programs is a diminishing trend. While my sample indicates that gender is implicated in the diffusion of computerized audio technologies (and, in turn, participation in music communities), I have no clear answers to this question at the present time. The gendering of music technologies is a rich area for future research.

Access to computerized music recording is, definitely, potentially wider, over and above prior modes of production in music. But this "widening of access" appears uneven, in that more and more, individuals coming from a background in computers express enthusiasm for their digital liberation, while some in other groups (especially women) feel that digital recording diminishes their access. However, as I explain in the final section of this chapter (on the subject of computerized music communities), there are apparently some exceptional cases, seeming to depend largely on background and familiarity with computers in a more general sense.

## 5.4. Peripheral Musical Communities: Multitasking, Computerization, and Community

Numerous participants in this study are exemplary of different degrees of involvement in musical communities. Some (PITTS, ABOA) are not really involved in any "music scene" at all. Some are (or were) involved in music communities (exclusively) in the traditional sense: attending friends' shows, distributing posters and handbills, self-organization of touring, and other features (Wendy, Scott). Some (Scott, Syd, Quinn, Kelly, Bill, Cielos) are involved, to varying degrees, in web-mediated promotion of their

music. Of particular interest in this study are those who fit into my last grouping: that of "digital scenester". Jack and Dani typify this emergent category: persons using computers and the Internet to construct and maintain communities (both online and off) around the performance, appreciation, and exchange of local, independent music.

Dani has been actively involved in creating alternative spaces for local independent music over the past two years. She, with the help of bandmate Doug, has put on a showcase night for local independent bands, which in two short years, has gained considerable local attention. The "organization" (called Whap! Productions) handles the showcase night, an interactive website (including classified ads, discussion boards, an MP3 page, music reviews, and space for video and photographic submissions), and a collective postering network. Whap! survives (that is, barely breaks even) by charging admission to the weekly shows (as well as taking a small cut of the tab from the bar), by selling advertising space on their website to local companies, volunteer labour, and informal agreements with a local video production company (which covers all of Whap!'s events in exchange for advertising space). Significantly, much of Dani's work for Whap! is computerized. Regular electronic mailouts to email lists and news postings to the Whap! website are the primary medium for maintaining the scene that has built up around Whap!'s activities. One might speculate that Whap! would take on a very different form had it been introduced ten (or even five) years ago, when web-based mediation of music was not as well known or effective. Says Dani:

> certainly, my background in computer software has been helpful...also,
> Whap! in its current form wouldn't have been possible were it not for the
> web's popularity...but still, I don't think the group of kids coming to
> Whap's shows (and the bands, too) would be as engaged with the website
> without the face-to-face aspects of Whap! (the shows, the postering
> network).

I have found Dani's example to be mirrored in the cases of a few other individuals involved in Vancouver music. Jack, for example (also a graphic and web designer), has maintained an "independent music portal" of sorts (called The Wax Museum) for a number of years now. He reports that while

> it began as an informational website for my band activities, and for linking to friends' bands...now it's incorporating a lot more streaming media, and a whole lot of information and links...in a sense it's starting to become a space to actually 'hang around' and listen to music, watch videos of gigs, and other stuff, rather than just a place to find out where and when local shows are happening.

Like Dani, Jack maintains extensive email lists for announcements of shows or releases of recorded material.

However, some notable opinions on community emerge from other musicians in this study. Bill, since leaving aLUnARED, has found himself working more and more within the confines of his computer in his efforts to promote his new musical project, Droom. He estimates that he sends out over 100 emails and/or discussion board postings per day to try and generate interest in his new band, both locally and worldwide. As well, Bill maintains a website for Droom, and regularly updates pages for the band on free bandpage sites like Newmusiccanada.com. All of Droom's music is available to download for free. None of this is very uncommon anymore. But there is one very interesting fact about Droom: the group was signed to an American independent label without ever setting foot on stage as a group. To date, Droom has performed live once. They have plans in the works for a U.S. tour, sometime later this year. Their debut CD (recording has been completed) is to be released to coincide with the start of their tour: Bill analyzes the situation as follows:

you don't have to prove yourself in a local music scene anymore. Anyway, I always found local indie rock scenes to be overtly 'cliquey', with built-in exclusions for artists who don't follow indie rock trends...look at Droom. I mean, we've got distribution all over North America without having to deal with any of those incestuous assholes.

I am rather amazed at the transformations that have taken place in all aspects of independent music in the past few years. There have been significant transformations (and in some cases, inversions) in the regimes and routines of its production, its promotion, and its distribution. The expanding reach of computerization, into music recording, music distribution, and mass communication, has permitted this change to take place. But not all individuals in music are adopting these changed modes of interaction and exchange. A few key actors seem more inclined to take on the role of "digital scenester" (as exemplified, in varying degrees, by Dani, Jack, and Bill). The adoption of this role seems to be attached to computer familiarity (both Dani and Jack went to school for computerized graphic design, Bill's background in synthesizers transferred nearly seamlessly to the domain of his home computer). Notably, full engagement with computerized music production, distribution and promotion depends on a significant amount of multitasking in divergent activities: word processing, accounting, web design, graphic design, mass communication via message board postings and email, and finally, music recording: tasks now vastly automated and rationalized by the same technological artifact - the home computer.

But the maintenance of independent music communities is plagued by the twin problems of (1) migration to the core, and (2) abandonment of the community by "growing out" of music (hinted at earlier in my narrative about Cielos). Bands form, deform and dissolve rather quickly, and the cases of both aLUnARED and Cielos

exemplify this ongoing structural characteristic of music communities. Building lasting institutions on which peripheral communities depend is also threatened by these phenomena, as the staff of college radio, independent record shops, and independent music press typically migrate toward well paid careers in broadcasting, the press, or entirely different fields altogether. Both of these phenomena deplete the periphery of its human resource pool on an ongoing basis, and two competing ideologies about the economics of independent music mediate these trends.

First, as mentioned in Chapters One and Two, myths about the social mobility of musicians from periphery to core are propagated by the mainstream music press and music television. None of the participants in this study voiced an overt belief in their potential to sign a contract with a major label, though I observed a few incidents that indicate the covert prevalence of this myth. During my tenure with aLUnARED, references to "buzz" were made by various members of the band, numerous audience members, and persons in the press with whom aLUnARED gave interviews. "Buzz" in this context refers to an optimistic tone in supposed "background discussion" about a particular band (or in some cases, about a particular music scene), suggesting that "people in the music industry are taking interest". Repeated mention of this "buzz", by a number of individuals in succession, tends to provoke an emotional response among some musicians, and aLUnARED were not immune from this.

In one case, while on tour, I observed how three repetitions of the word "buzz" (in one day, by three different people outside the band) inspired a highly optimistic, emotionally charged atmosphere. This optimism reached a crescendo early on in the tour, and survived for a full two weeks through poorly attended, low paying shows in small

venues. While I cannot make any conclusive statements about the meaning of this, this phenomenon of "buzz" seems to psychologically justify the rigors of the road tour, an otherwise overwhelmingly bleak, dull, dirty, and financially and emotionally draining experience. Reminiscent of the comedic ironies depicted in the film *This Is Spinal Tap* - in which the momentum of the band's touring efforts is maintained by naïve optimism, clearly at odds with the facts (no one shows up at their record store autograph session, radio announcers are unaware of their existence, and the band is slated as the opening act for a puppet show) – aLUnARED's touring efforts demanded a group psychology conditioned by the myth about "buzz", or the potential for success.

Second, independent musicians may be motivated to abandon music as a career pursuit by a cynicism that commercial success is impossible. Again, this was never overtly expressed by any of the participants in this study. This, too, is partly a myth – though it may quite accurately reflect the economic conditions of independent music making (as discussed in Chapter Two). The problem with this cynical narrative is that it still foregrounds commercial, "core stream" success as the sole option for remuneration in music, and discourages engagement in a proactive role in building alternative spaces. I observed this cynicism (expressed covertly) moreso in my discussions with electronic musicians such as Quinn and Scott, but only in relation to their use of computer technologies. Said Quinn: "I gave up on making money from music a long time ago...I like making music to amuse myself". Scott invoked the notion of "growing out of music" rather succinctly: "if it weren't for recording software, I would have given up music a long time ago...I'm not so young anymore, I've got a demanding job to worry about...now that it's cheaper, I can treat it more like a hobby than a career". Kelly

concurred: "it's just something I do...it's never been about making any money or becoming famous...my education takes precedence over it".

Independent music production is not only technologically mediated. It is also pushed and pulled by attitudes toward community, and toward technologies. It may also be mediated according to preexisting social hierarchies (such as the gendering of musical practice). Finally, the maintenance of local music communities is threatened by two competing myths about the chance of social mobility (from periphery to core). The collusion of these myths with the democratizing claims of recording software and band website enthusiasts (Scott, Quinn, Bill) is suggestive of, and consistent with an increasing ambivalence about localized music communities, although some participants (Jack, Dani) still work hard to maintain these local spaces.

## Chapter Six: Discussion

The early twenty-first century independent musician may experience an increased "flexibilization" of their work – flexibilization of their compositional and recording regimes, of the spaces they use to make music, of the time they spend working on music, and of the skills required to effectively disseminate their music and find an audience. All of these changes are enabled by the opportunities presented by computerization of production methods and distribution networks, and may be accompanied by a coincident abandonment of prior spatial locations of musical "community".

My qualitative research has taken me into the minds, homes, computers, and "outboard" locations of individuals composing, recording, promoting, and dialoguing about music made for little or no reward. In the hope of understanding whether or not the infusion of computer technology in peripheral music communities might widen access to or decentralize musicmaking (or perhaps enable musicians to increase rewards, or at least, decrease their financial liabilities), I have realized that this is the case for some, but that the technologies may present social barriers to others.

Respondents like Quinn, Kelly, and Bill, who come into music from "unconventional" backgrounds (little or no prior involvement in former patterns of indie music production - involving guitars, campus radio, postering, professional engineers, and other twentieth century artifacts) seem to be the main beneficiaries of this decentralization. Others, like Wendy and Monica, may experience further exclusion via the arguably gendered nature of both music and technology. Certainly, by gender, attitudes toward music technology seem to differ, though my sample is very limited. Dani was the exception to this rule, already connected to the "boy's world" of technology

through her expertise in graphic design and web development. The female musicians I spoke with expressed that the technologizing of music was a new mode of gender exclusion; having felt challenged enough already to learn a "boy's instrument" (and to struggle for acceptance in live music scenes as a competent musician), now they were presented with a whole new set of challenges to be considered equal to their male peers. I am persuaded by these arguments (and the aforementioned gender bias among music software buyers) that computerized musical practice presents more challenges to women than to men. This – gender - is perhaps the most significant way in which computerized musical communities may reinforce prior status divisions.

But notably, access to musical production tools is restricted to those who are well-off enough to purchase a high end computer, software, and relevant hardware – consumer products that are structured into price points revolving around perceptions of the "professional" and the "amateur", and "the home" and "the studio". I cannot ignore the fact that all of the respondents and participants in this study are at least at this level of financial stability – all of them employed, and all of them living in a city with a relatively high standard of living, compared to musicians in other peripheral communities around the world. Arguably, though, this has always been the case, because conventional musical instruments are no less expensive than digital audio tools currently on the market.

Participation in computerized musical communities might become limited to the tech-savvy musician or enthusiast (who can at least afford to own a cable modem or ADSL connection, subscribe to cable internet or DSL services, and learn software applications quickly). Taking up any role in the production of independent music is also potentially limited to those with sufficient spare time to invest in learning software, or

those who have backgrounds in a number of various multimedia applications. A computer background seems as essential as a musical background. Obviously, these are fairly strict limitations overall: technical knowledge, money, time, and gender. A higher presence in music communities of these types of individual might lead to increased technophilia (shared by some euphoric electronic musicians) relative to other values (support and participation in localized music communities, something about which some musicians actually professed disdain). Still, other musicians continue to make music regardless of the technology involved, professing no interest in musical communities whatsoever (PITTS). As I pointed out in Chapter Three, the use by software developers of the metaphors of MIDI and the multitrack in music software may be a significant status divider among musicians. While these statuses were, largely, not acknowledged by participants and respondents in my study, there was at least one isolated instance of the awareness of this form of status: ITTIC's expression of their fear of disappointing results due to relative inexperience in computer studios.

As to conditions of creative work, I have discussed several findings. Musicians increasingly work at their own pace with computerized studios. There is actually more time for dialogue, and less equipment to fuss over. I observed this at James's studio. This is actually promising for the small studio owner, in which musicians can collaborate with an engineer without feeling boggled by mountains of unfamiliar gear, and in some cases, feel that they have an understanding of the processes at work (computers=familiarity). Communication between engineers and musicians is still (as before) an essential component of productive experiences in recording music. Still, there may yet be gendered problems on this front: the women I queried expressed ambivalence about their recording

experiences: saying that both computerized and noncomputerized situations were intimidating ventures into a world that they perceive as monopolized by males.

How has the procedure of recording and composing changed in the shift toward computerized environments? For Cielos, ABOA, and PITTS, it has not changed at all; each pair of musicians was able to maintain their respective procedural regimes in the studio. On closer inspection of the various procedures attempted by aLUnARED, the results were mixed: their collaborative relationship ran into conflict over preferences in collaborative modes. With aLUnARED, the spatial problems created a situation in which there was little accounting for equality of contribution. In their practice space, and in the commercial studios they worked in, there were spatial and temporal limitations on contributions. The challenges of geography, working at home, and remote collaboration worked to confuse roles and contributions in their writing and recording experiences.

The convergence of technologies related to the production, promotion, and distribution of music onto a single platform and device has some social consequences. In my participatory capacity, I experienced domestic stress in my home, negotiating between work and leisure as the work of aLUnARED came to be diffused into my home. Some may feel pressure to be constantly working because the technology is in front of them in their home all the time. But "working" at home is for some a rather "unworkable" condition: there are more interruptions, less privacy, and negotiations with those who share domestic spaces for other purposes. Perhaps, only those who live alone (such as respondents Scott and Syd) are free from these difficulties. To them, again, may go most of the benefits offered by computerized recording.

As discovered in my discussions with engineers, there are other potential consequences for the wide dissemination of music recording software. The small studio owner is most threatened by this prospect: technologically capable musicians who abandon the cheap recording studio for the cheaper confines of their bedrooms. Both Dave and Jasper voiced this concern. Engineers employed by core stream companies were, perhaps appropriately, less worried about their personal futures and fortunes in their vocation.

In terms of what I learned and did not learn in undertaking this study, I feel confident in making some suggestions for future studies of independent music. First, engineers working on the periphery (serving the periphery of musicians and bands) are going to experience serious challenges doing business. As Dave pointed out early on in this research, this process has already been underway for some time. Engineers without the security of experience and reputation in core stream music production circles may have to cut their rates to a point where they extinguish their own incomes. An economic impact study might be in order, to weigh the costs and benefits on the recording studio industry at all levels of professional activity – studios relying on core stream contracts, studios who service independent music communities, and all studios and independent engineers and producers in between these two economic strata.

Second, a widespread adoption of computerization in almost all of the tasks involved in composing, recording, promoting and disseminating music has the potential to abstract peripheral communities from the physical spaces they still currently occupy. While the success of Whap! evidently relies on a physical meeting space (the club night organized by the company) for its success, it may be that opportunities for such ventures

may become fewer. This is especially the case in Vancouver, where the number of live music venues has shrunk in proportion to the growth in dance clubs and sports bars in the past decade. Complicating this problem is the ephemeral nature of the peripheral music community in Vancouver, subject as it is to forces of (1) migration of talent to the core stream, and (2) longitudinal instability due to musicians "growing up" and abandoning the scene (suggested by the dissolution of Cielos). To this end, an in-depth probe into the social structure and dynamics of independent (peripheral) production and distribution networks seems warranted. Preserving alternative spaces for musical expression outside the core stream of the music industry is vital to a participatory, diversified musical landscape. Creating and maintaining stable institutions in production, distribution and media is essential to preserving the periphery. Confronting the forces of ephemerality in the periphery, while seeking to make the periphery more viable, calls for a closer documentation and deeper understanding of how peripheral music communities form, maintain themselves, or dissolve.

Third, the demographic orientation of musicians occupying the periphery may be increasingly shifting towards the computer literate, financially well-off male. Barriers for entry into music production may rely increasingly on technological (and not musical) expertise and interest, and may be further structured within music communities along the lines prescribed by price points for computer audio hardware and software. Pursuant to this, the development of a technophilic underclass of peripheral musicians may further entrench musicians in a culture based on the consumption of technologies. For all the rational control over music offered by computerization, the technophilic ideology expressed by many musicians I encountered in this research brings them directly under

the radar of a group of software companies. And while these companies are, for the most part, small, independent entities, the widespread adoption of their products may make them appear to be lucrative investments for venture capitalists and core stream media companies seeking to profit from every stage of musical production, distribution, and consumption. In this light, close analysis of the marketing of recording software (and the relationship of consumers and other mediators, such as retailers, developers, and advertising) is warranted. Relatedly, as I have already pointed out, the gendering of technology is a rich area for future inquiry; the creation and maintenance of "safe" institutions that are sensitive to the potential of technology to be gender-biased merits gender-specific research in the diffusion of audio technologies.

Fourth, further ethnographic work on the nature of "independent music communities" is warranted. The methodological challenges I experienced in carrying out this study highlight the problematic nature of the "popular" and the "periphery" – problems that space and time restrictions limited my ability to fully address here. After all, Vancouver's "local popular music community" consists of more than merely aspiring rock stars. Jamaican music, Salsa, Country and Western, Jazz, Folk, New Music, Chinese Opera, Experimental electronic, and Blues communities (to name a few) are all simultaneously present in this city, each representing a distinct periphery of its own. As these communities are distinctive in terms of their socioeconomic membership profiles, prevailing ideologies and attitudes, engagements with technology, and degrees and types of media exposure and feedback, the implications (let alone the theoretical premises) of my research are not easily generalized in a discussion of technology and "popular music", more broadly construed. Research into the social impact of audio production and

distribution technologies on these communities will likely entail a research design that is very different from the one I chose. Still, studies of this range of communities are warranted, as they are all seemingly constrained by the same political economic structures (the core popular music industry, which marginalizes them all, generically).

Finally, the historical implications of the computerization of production and distribution of popular music are still unclear. The "virtual" bias of computer technologies, indeed, appears poised to destabilize the core's monopoly of musical knowledge - formerly maintained through the conquest of space through global distribution and media, and the monopolization of time through flexibilization and the cultivation of an ideal of optimism about social mobility at the level of the localized margin. As I have argued, peripheral music communities are populated by competing ideologies about the "local music community" and its merits: some value isolation, while others actively pursue the construction of localized cultural spaces. The myths about mobility from periphery to core (propagated in both mainstream music media and the marketing of recording software) may find receptive ears among new musicians whose entry into production is primarily mediated through computers. For these musicians, the notion of "digital DIY" may be the ideal that replaces former ideals about fostering localized, alternative spaces for cultural production. Such are the simulacra that require continual examination and reflection with respect to History.

In conclusion, a technologically mediated decentralization of music production is more complex than it may first seem. The study of popular musical communities is an encounter with a complex nexus of technology, ideology, media, and myths that demands considerable theoretical flexibility, and a willingness to accept some questions as

unanswered – discursive points of departure, to be taken up by other scholars. A seemingly simple query, like "does the DAW decentralize music-making?" opens up dialogue, demands historicization, and reveals unexplored avenues, inviting further questioning.

## Appendix: Project Studio Equipment

In the project studio component of my study, I installed a temporary recording facility in a small room at New Media Innovation Centre (NewMIC). The following equipment was and structures were used:

iMac computer (G4, 800 MHz CPU, 60 GB internal hard drive, firewire and broadband modem-equipped).

Mark of The Unicorn (MOTU) 896 8 channel firewire audio interface.

External firewire hard drive (80 GB, 7200 RPM, a commonly accepted minimum standard speed for multitrack audio editing work)

One pair of large Koss studio monitors, situated on the floor (rented)

8 SM57 microphones. 1 Audio-Technica condenser microphone (rented)

2-way headphone preamp/splitter, and two pairs of headphones (borrowed)

Software in use during the studio's run included Cubase 5.1, Reason 1.0, Waves 3.5, OS 9.2. I chose these hardware and software formats because they represent likely scenarios for budget conscious home recordists. It is less likely that a home recordist would be able to afford (or accommodate spatially) more expensive systems (like ProTools' integrated hardware systems) in their homes or rehearsal spaces. This system gives them 8 independent channels of digital audio I/O ("in and out"), with the added benefit of being relatively inexpensive and more compact. Also, the software employed (using the more generic ASIO standard) is more likely to be compatible with free (that is,

legally free) sound programs that the musicians could download to their home computers – facilitating further exploration and use of their recordings after their sessions ended.

Overall, the studio offered modest functionality (only two people could simultaneously monitor live audio sounds as they were being played). While this facilitates some situations well (like live drum kit recording), it negates the possibility of others (recording a whole band "live off the floor"). Budget constraints brought on this limitation.

Four baffling structures (later to be situated between sound sources in the room) were built. As well, the bass traps/"coffins" were manufactured from the same materials (found carpet, cheap plywood, and cheap, consumer grade sound insulation stuffed inside). Chairs, tables, broadband connectivity and caffeinated beverages were supplied by NewMIC.

Though most of the gear involved was owned by me (donated for the duration of the project), the total costs involved in setting up the studio (including the retail value of donated and rented equipment) would be approximately $8,600 CDN. At this time (approximately a year after the studio was in operation), this may have dropped by about $1,000 or more, as a result of the rapid depreciation patterns of home computer systems.

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