

Changing Technology and the Rise of the Canadian Rock Recording Industry

• • • • •

by

David J. Promane, B. Mus

**A thesis submitted to the Faculty of
Graduate Studies and Research in partial fulfilment
of the requirements for the degree of
Master of Arts
in Canadian Studies**

Carleton University

OTTAWA, Ontario

May 17

2006, David Promane



Library and
Archives Canada

Bibliothèque et
Archives Canada

Published Heritage
Branch

Direction du
Patrimoine de l'édition

395 Wellington Street
Ottawa ON K1A 0N4
Canada

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file *Votre référence*
ISBN: 978-0-494-16440-2
Our file *Notre référence*
ISBN: 978-0-494-16440-2

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.


Canada

ABSTRACT

This thesis examines the development of Canadian sound recording with an emphasis on the technology available and used for recording rock music. This examination focuses, in particular, on the recording methodologies and the evolution of the 'project studio' in northern Ontario. A history of sound recording and the technologies developed within the 'production,' 'project' and 'home recording' studios provides context for this examination. The effectiveness of the project studio in northern Ontario is analyzed by exploring the project studio of Timmins engineer and project studio owner, Greg Vintar.

TABLE OF CONTENTS

FOREWORD	.....Page 03
INTRODUCTION	.....Page 04
CHAPTER 1 - The Rise of Sound Recording	.....Page 27
CHAPTER 2 - Canadian Studios From 1970 -1990	.....Page 53
CHAPTER 3 - Home Recording and Digital Technology	.....Page 77
CHAPTER 4 - Creativity, Process, and Production	.....Page 87
CHAPTER 5 - The Life and Times of Greg Vintar	.....Page 114
CONCLUSION	.....Page 129
APPENDICES	
Appendix A	.....Page 137
Appendix B	.....Page 175
Appendix C	.....Page 184
BIBLIOGRAPHY	.....Page 192

FOREWORD

Throughout my career as a musician I have had the opportunity to perform with and learn from many talented individuals. There are many individuals that I would like to thank for giving me the gift of music. First and foremost, I would like to thank my brother Barry who has been my musical partner since the beginning. Barry and I started our first rock band at the age of eleven; this marked the beginning of a long, successful partnership in music. Not only have we played on several professional albums as a unit, but we have also earned undergraduate and graduate degrees from the same institutions.

Growing up in Timmins, Ontario, I had the privilege of working with a knowledgeable guitar teacher named Steve Clermont.

Clermont inspired me through his own actions to push myself further as a musician and individual.

At the age of eleven, Clermont introduced me to Greg Vintar. Vintar was always willing to take time out of his busy schedule to repair my broken equipment and to teach me the basics of audio and electronics. I became fascinated, not only by the technical side of musical equipment, but by Vintar's knowledge of the music industry itself. Vintar and I began spending countless hours discussing controversial aspects of the music industry and the effects of corporate powers on the musician. Vintar was a mentor early in my musical life and continues to be today.



DAVID J. PROMANE

As a member of the rock group *Stone's Throw*, I was introduced to James Mongeon, an engineer and production company owner. Mongeon became a key member of our touring band acting as our sound tech and tour manager. Mongeon is a knowledgeable individual and has given me insightful information regarding the recording business and digital technology.

I would like to thank the following professors for making my learning experience at Carleton University so fulfilling: Elaine Keillor, Bryan Gillingham, Allan Ryan, Deirdre Piper and Stephen Rollins. The following musicians and teachers have been my friends and helped me out whether in basement bands or professional studios: Barry Promane, Dean Grenville, Greg Vintar, James Mongeon, Shaun Brown, Steve Clermont, Ron Spadafore and Philip Candelaria.

INTRODUCTION

CHANGING TECHNOLOGY AND THE RISE OF THE CANADIAN ROCK RECORDING INDUSTRY

How has the Canadian rock recording industry evolved? What technologies have been used to create modern sound recording? As new technologies evolved, were all of these technologies available in all of the regions of Canada, or did the remoteness of certain areas limit their accessibility to technology? How did these new technologies impact musicians, and how did technological limitations affect the sound from a given region? Academia has failed to thoroughly answer these questions as they relate to the evolution of the Canadian recording industry. This thesis will examine the development of Canadian recording with an emphasis on the technology available and used. The focus of this examination in particular will be limited to recording methodologies and the evolution of the project studio in northern Ontario. Although this thesis will be limited to a certain region of Canada, the situation researched will be considered as part of a broader phenomenon.

Where would the contemporary music industry be without audio recording? It is safe to say that the music industry as we know it today would entail something very different had not the advent and progression of sound recording continually shaped and defined the musical potentiality of recording artists. Cultural and regional identity, creativity, performativity and performance rituals, political economy, race, gender, and iconicity, are a gambit of intertwined factors, all of which mediate the representation of visual and sonic artifacts, which are endorsed by dissemination. These foundational concepts forgather the contemporary framework of the

recording industry as we know it, which is reinforced and harbored by the practice of recording. To this end, audio recording is essential for the promotion and distribution of an artist, whereby rock and popular musicians are promoted internationally through the offices of the media. It can be argued that without the distribution of sound recording, twentieth century artists would have been limited to a small fan base that only could be accumulated through live performance. I would argue that a recorded product enables the listener to re-live the live performance at their own leisure. International recognition has come into being with the innovation of play-back devices, including home/car stereos, and personal media devices (MP3 players, walk-mans, disc-mans).

Due to Canada's geographic diversity, Canadians have been forced to use innovative methods of recording in order to disseminate recorded goods. Many vibrant studios exist in isolated northern regions of Canada. Throughout the 1970s, Canadian musicians and engineers from isolated regions, began establishing small "project studios" out of necessity . Professional studios have existed in Canada since the rise of sound recording, yet they have not been available to amateur musicians, or artists in thinly populated areas. Following the CanCon regulations implemented in 1970 (discussed below), Canadian musicians from all over the country were eager to record compositions and enter the Canadian recording market.

Through my own personal experiences growing up in a northern isolated region I have become familiar with many musicians, engineers and studios. By experiencing and analyzing the recording process in that area, I have distinguished between three forms of recording studios

which exist in Canada, the home studio, the project studio and the production studio.

The home studio generally consists of a small digital setup, including a home computer and mixing console in the home of the musician. This studio is used for recording demos and documenting rehearsals. The project studio is more professional than home recording and uses higher fidelity recording equipment. The engineer is often the owner of the project studio. Home and project studios are beneficial to musicians who live in isolated areas of Canada, and who cannot afford or access production studios. Production studios are the highest quality and most costly studios. They cater to professional musicians and produce the highest fidelity of sound possible.

The existent literature in the field of Canadian sound recording does not adequately describe the recording situation that I have experienced in northern Ontario. Authors such as Hawkins (2002) and Greenwald (1992) have documented important elements of home recording and technology by writing texts in the form of *how-to* manuals. Hawkins describes such things as computer systems, digital audio sequencing, plug-ins, virtual instruments and midi technologies. Greenwald elaborates on the amalgamation of digital and analogue technologies, and their respective roles within modern home recording. Although these authors provide basic information on how to record and set up a home studio, they do not address the benefits of home recording in isolated regions. Home recording has become vital in the promotion and dissemination of recorded goods for amateur and professional Canadian rock musicians, specifically for those in the north.

Rather than focusing on specific recording practices, Edward B. Moogk's *Roll back the years: history of Canadian recorded sound and its legacy ; genesis to 1930* (1975), provides a list of Canadian recording artists and recordings from the beginning of sound recording to 1930. This is the only piece of Canadian literature that thoroughly documents Canadian recordings and recording artists. Unfortunately this work is limiting because it only documents the Canadian recording scene until 1930. Therefore, this work does not focus on rock music or the technologies used in its recording process.

The work of Paul Théberge is relevant to this discussion as he discusses changing technologies. Théberge's *Any Sound You Can Image* (1997), is an innovative and informative piece of literature that describes the making of music and the consumption of technology. Théberge divides his work into three sections. Part One describes the design and production of the musical instrument industry, while Part Two analyzes forms of mediation, including magazines, networks and user groups. Part Three, titled Technology and Musical Practice, in particular relates to this thesis. Although Théberge describes the broad social and historical perspective of the music industry by documenting the ever changing state of recording technology and how technology actually affects the sound, he does not dissect the different forms of studios. Accordingly his work does not deal specifically with the recording situation as it exists in Canada nor does he discuss the implications for acquiring and using recording technologies in isolated regions.

In his *Popular Music in Theory* (1996), music theorist, Keith Negas, examines the social and cultural implications of popular music rather than dealing with specific recording methodologies. Negas explores elements that link the music industry, audiences, producers and consumers. Negas describes the social processes of popular culture that intervene between and across the production/consumption divide. He further examines the methodologies used to mediate popular music through a series of technological, historical, cultural and political factors. Elsewhere, Negas investigates the effects of corporate cultures on popular music in his work *Music Genres and Corporate Cultures* (1999). Throughout this work Negas reveals how the creation, consumption and circulation of popular music have shaped record companies.

Although Negas' work is based highly on cultural and theoretical studies, he is able to dissect popular culture and question modes of consumption, and the effectiveness of record labels. Like Théberge, Negas' work fails to document the effects of recording practices on specific regions and cultures.

In H. Stith Bennett's article, "Going down the Pub" (1997), which appeared in the journal *Popular Music*, the author describes how local cultures are reflected in live performance in pubs. Bennett is aware of the importance of regionalism in rock music; he states: "at the local level... both musicians and audiences become attuned to the commonality of social experience that bonds them together, this is in turn playing a decisive role in framing the politics of performance and reception" (Bennett 1997, 99). This aspect of commonality is evident within regional sound pockets across Canada. In this thesis I will relate Bennett's framework of regional experience to

elements of sound recording.

To my knowledge, historical literature describing major Canadian production studios does not exist. There has not been an attempt to analyze Canadian recordings through technology used by a particular type of studio or producer. Literature in the field of Canadian recording is scarce and does not adequately document the situation in the northern regions of Canada. Furthermore, to my knowledge, no author has distinguished between studio technology in the way that I present here. In works by such authors as Théberge and Negas, recording studios have been categorized as either home or professional studios. In my investigations, engineers and active members of the Canadian recording industry readily identify professional studios as production studios while stating that “project studios” (which academia has failed to address) are perhaps the most important studios in Canada. The project studio has been pivotal to musicians who wish to record and promote their music from isolated regions of Canada.¹ In order to understand the rise of the project studio and Canadian sound recording, one must understand the CRTC and CanCon quotas.

CANCON AND THE CRTC

In the years prior to 1970, Canadian rock musicians were growing increasingly frustrated with the lack of support from Canadian cultural industries. The financial instability of the music business, coupled with generally poor promotion, led musicians such as Neil Young to relocate

¹Through personal communications, Timmins’ musicians including Rick Savard, Dax Chenier, Dean Grenville, James Mongeon and Greg Vintar expressed the belief that the project studio is essential for the dissemination of recorded goods in an isolated region.

to the United States. According to Yorke, popular music in Canada “simply did not exist” (Yorke 1971, 1). The Canadian rock scene was highly dominated by American values and performers.² By the late 1960s, “the government was pressured to become directly involved in the cultural industries in order to consistently follow through with the efforts to build a strong national identity whilst protecting Canada from mass absorption into the American popular culture” (Moore 2002, 43). Because of demands for independence within the arts, in January of 1970, Canada’s federal government created the Canadian Radio-Television and Telecommunication Commission (CRTC). In the following year, the CRTC, chaired by Pierre Juneau, implemented legislation declaring that radio stations must have “thirty per cent of Canadian content on AM radio” (Keillor 2002, 282). The CRTC’s new quota system increased distribution and demand for Canadian rock music.³

By the early 1970s the Canadian music and recording industry were beginning to take shape.⁴ Moore notes that “there was a scramble to build Canadian record companies and to sign new Canadian artists in order to have Canadian music to actually play on the radio stations” (Moore 2002, 46). Over the next several years, this increasing demand for musicians led to a booming recording industry. Established record labels began seeking musicians, and, to meet the

²Bernie Finkelstein, creator of True North Records describes the Canadian music business in the 1970s: “I never heard the words ‘Canadian music business’ together until the middle [19]70s. There was no Canadian music business” (Wagner 2006).

³For additional information regarding the CanCon policy see Heritage Canada’s website at http://www.pch.gc.ca/progs/ac-ca/pubs/can-con/can_con.html.

⁴Groups such as The Band, April Wine, Triumph, Helix and Heart grew in popularity following the introduction of the CanCon regulations. Throughout the 1970s and ‘80s, these artists produced several hits and were promoted on Canadian airwaves.

demand, studio owners began investing in new facilities and state-of-the-art technologies in order to make the recordings required. To properly understand the rise of sound recording within the rock genre, one must understand Canadian national identity as reflected within the rock genre.

CANADIAN NATIONAL IDENTITY AND ROCK MUSIC

Within Canada, numerous cultural groups affirm Canada's multicultural construction and identity. Since Canada celebrates cultural diversity in so many ways, it becomes difficult to track multiculturalism through popular music. Because Canadian painters⁵ and classical musicians⁶ have both constructed works inspired by the mythologies that help define Canadian life, it can be said that a national identity does in some way exist. As Schafer notes:

What makes the arts such an integral part of the Canadian experience is the fact that Canadian artists express their feelings, thoughts, perceptions and beliefs about a variety of matters relevant to the country and its citizenry in profound and often moving ways. As such, they create the images, symbols, similes and metaphors which are indispensable to forming an impression of who we are as Canadians, why we act the way we do, and what Canadian culture is really all about (Schafer 1988, 6).

I often question; what is Canadian about Canadian culture? It would appear that even within more traditional art forms in Canada, multiculturalism is overshadowed by mythologies

⁵ In 1920, J.E.H. MacDonald formed the *Group of Seven*, along with Lawren Harris, A.Y. Jackson, Arthur Lismer, Franklin Carmichael, F.H. Varley and Frank Johnston. They "were painters bitten by the Canadian north who, for the first time, took on the task of painting the great power, scenery and spirit of their land" (Tom Thompson Memorial Art Gallery 2006).

⁶R. Murray Schafer is known as a composer of "environmental music." Schafer's *Music for Wilderness Lake*, was performed using twelve trombonists positioned around the shores of an unpopulated lake. This was done in order to play meditative music across the water to one another at two specific times of day; dusk and dawn. Schafer was positioned in a raft in the middle of the lake in order to conduct the piece (Rothenberg 1995, 150-163).

such as the great white north, or the tranquility of nature. One reason might be that contemporary Canadian experience in all its diversity, is a subject that is far too difficult and abstract to create art forms around; the result is often a sketchy notion of what constitutes Canadian identity. The Canadian music industry is a case in point.

One aspect that needs to be examined is the timbral quality found in Canadian rock music. Does a Canadian rock sound exist? This is difficult to answer because a variety of factors impact on what constitutes Canadian rock and what key characteristics can be attributed to its sound. Many Canadian musicians and consumers wholeheartedly believe that a Canadian sound in rock music is apparent.⁷ They believe that space is the key element which denotes Canadian rock music; space, in terms of musical arrangements and space in terms of orchestration and harmonic complexity.⁸

Others feel that Canadian rock music has other traits which define it as being Canadian. Characteristics pertaining to lyrics that portray Canadian life make the music Canadian. Furthermore, some believe that specific recording studios within Canada create a unique sound.

⁷ The Tragically Hip, who “have spent many years at the top of the Canadian music scene while remaining virtually unknown in the States” possess a ‘Canadian like’ sound (Plastic 2006). This may be due to their limited use of studio technologies, simplistic compositions and depiction of Canadian stories in their lyrics.

⁸Bruce Cockburn attempts to articulate the Canadian sound by stating: “I think a lot of the songs that are being written are distinctively, if not obviously Canadian... I think it has something to do with space that isn’t in American music... Maybe it has to do with Canadians being more involved with the space around them rather than trying to fill it up as Americans do” (Keillor 2002, 284-285).

This is controversial because the technology responsible for creating a specific sound in a recording studio may be available internationally. This thesis will examine whether the manner in which Canadian studios operates through the use of project studios and home recording is unique. This in turn could have an impact on the resultant sound.

Even if a song or a band portrays 'Canadian' traits it does not solve the problem of expressing nationalism through music. Writers who make strong claims that a Canadian national sound does exist often fail to consider that within the vastness of the Canadian mosaic, there exist multiple cultures and multiple geographical circumstances which impact on musical production and which inevitably are lost when generalizations are made. Geddy Lee, the lead singer and bassist for the Canadian rock band, Rush states:

You know, I talk to a lot of people who talk about the Canadian sound and talk about us [Rush] as part of it. Having come from it myself, I really can't see what the Canadian sound is and I'm not sure if there really is one. In England, people are surprised that we are Canadian because there is a feeling there that if you're a Canadian you're a folk singer. The country has quite a folk image. Internationally, we are also looked at as a little different for a Canadian group because we have a little bit of flash in our show and we are very heavy-metal, and up-tempo. It's really surprising that a lot of people think of Canada as husky lumberjacks (Melhuish 1983, 160).

The ambiguous image of Canada and Canadian rock abroad, can be linked to the vagueness in rock's definitions within Canada. For me, regionality is the key component in understanding how Canadian identity operates within the rock genre. I use 'regionality' as a term which reflects musical happenings that relate to cultural, political and economic activities within a given region. The size of these regions varies, fragmenting the interpretation of the term rock itself. I don't believe that a national sound exists, however, I do believe that regional

characteristics within rock and other genres of music create regional specificity within Canadian borders.

Putting the music aside for a moment, one must examine national identity through the eyes of the musicians themselves. When Canadian composers of rock music sit down to write a piece of music, do they believe that they are creating a Canadian sound, or composing in a Canadian way?⁹ This question becomes problematic because composition is a personal thing, and rock music has no fixed creative method. While some people say ‘Canadianess’ is apparent in their music, others reject the idea entirely.

As a Canadian musician from northern Ontario, I feel that some musical subtleties are present within regions in Canada. Musicians are influenced by their surroundings in terms of performance and recording practices. From an early age I was inspired by a vast guitar sound created by multitrack recording. By listening to Canadian groups such as April Wine and seeing them in person, I was strongly influenced by their compositional abilities and their use of multitrack recording.¹⁰ In terms of nationalism, the next question I would propose is one that relates to its importance within the rock sphere. In popular music, should it even matter if a

⁹Through personal communications, members of April Wine and Honeymoon Suite, have explained that they do not compose rock music with ‘Canadian’ traits in mind. Rather, they compose music about a situation which may or may not relate to their homeland.

¹⁰The members of April Wine are recognized for their use of multitracked guitar harmonies. This method of recording was largely responsible for the success of their 1975 release, *The Whole World’s Going Crazy*. This was the first Canadian album to sell over 1,000,000 copies (platinum) (Jackson 1994, 28).

Canadian sound exists? Neil Peart, the drummer and lyricist for the internationally acclaimed group, Rush, says:

The more I learn about the world, the less nationalistic I become. I really want to get one of those Citizen of the World flags like they use on boats and hang it over my house. I'm very, very tired of nationalism, I must admit. As far as musicians go, I have aspirations for musicians in general. The doors are open in Canada now. There's no reason anymore for excuses that Canadians can't make it unless they go to the States. There is real individuality in Canada, but not where people look for it. It's there; it's always been there-in the Laurentians, in the Prairies, out in Vancouver - but you have to get out there and find it. Nothing will stop true originality and no amount of flag waving can accentuate it (Melhuish 1983, 164).

Peart seems to claim that Canadian musicians have endless opportunities if they possess originality and creativity. While these qualities are the main selling features of Rush, the undeniable reality is that many Canadian popular musicians, like other musicians around the world, do not strive to be innovators; they simply wish to play music as a profession. Perhaps the degree of creativity reflected in the music of Rush qualifies them as original, yet as Peart notes, that does not mean that their particular sound is in fact Canadian in nature. Timbrally, it does not resemble any other rock style in Canada, but it certainly does not depict the 'Canadian way.'

Aside from strict musical analysis, one might examine lyrics as another form of expression in terms of Canadian identity. I would suggest that a small number of Canadian rock bands have adopted Canadian life as a basis for thematic material in their songs. Are bands such as the Guess Who, April Wine and the Tragically Hip successful in depicting Canada as a nation within their lyrics? I would argue that most of these bands touch upon mythological notions of Canadian life rather than expressing the diversity that exists within this country today.

A historic point, 1967, the year of the centennial in Canada, opened a new wave of nationalism that spread across the country. Bands such as the Guess Who embraced representations of nationalism in their music as a means of selling themselves. In doing so, they profited enormously within Canada, since not many rock bands had previously attempted to speak of Canada in their songs, because they found it restricted their attempts to break into international markets. At the time, a lot of Canadian rock music was modeled in some way around American rock, but a few bands like the Guess Who went against this practice, in an effort to showcase Canada, and win over Canadian audiences.

The Guess Who promoted Canadian national identity as their selling feature. By creatively packaging their song entitled “American Woman,” and sending it to American radio stations without telling anyone that they were a Canadian band, they were able to obtain exposure in the US which then spilled into other areas of the world (Einarson 1995). The result was one that was surprising, as American disk jockeys started spinning the tune assuming that it was by an American band. Once the song was a hit, they discovered that it was by a Canadian band, and that the song was in fact an attack on the American way of life.¹¹ Following this stroke of luck, the band continued to push their ‘Canadianess’ and promoted themselves as a purely Canadian

¹¹The lyrics for American Woman were inspired by live performances where Cummings would look out at an audience of mainly Canadian women and find himself preferring their appearance to that of American women encountered on an international tour. Furthermore, the lyrics were “a scathing commentary on America’s imperialistic attitude at the time of the Vietnam War” (Song Facts 2006).

nationalist band.¹² As Einarson described:

Rather than denying their identity or submerging it into some North American counterculture pseudo-hip image, the Guess Who openly championed their Canuck-identity. They were the nerds of rock music, those strange Canadians with the smiling beaver logo set in an enormous red and white maple leaf flag, chuckling all the way to the Canadian Imperial Bank of Commerce (Einarson 1995, 10).

In post-centennial Canada, efforts were put forth by various Canadian artists, more so lyrically than musically, to depict life in Canada and its happenings. Einarson confirms this, saying:

Suddenly, Canadian was cool. American kids dusted off their school atlases to search for such strangely exotic locales as 'Red Deer, Terrace and Medicine Hat' from "Running Back to Saskatoon." Expatriates like Winnipegger Neil Young turned from singing about 'Four dead in Ohio' to 'There is a town in North Ontario,' and Robbie Robertson moved his colorful canvas of historical images of post Civil War Dixie to the seventeenth-century French Canadian community of Acadia (Einarson 1995, 11).

The success of certain rockers using Canadian texts further stimulated the Canadian recording industry. Following the quotas set in place by the CRTC, musicians began to realize that they could become successful artists without leaving their homeland. By the early 1970s, musicians were scrambling to record their compositions in the hopes of attracting the attention of major record labels.

Wanting to get into this action, musicians from northern regions of Canada, specifically

¹²After making recordings in Canada and having them accepted abroad, the realities of the megamusic business, insofar as distribution, studios and finance were concerned, meant that Canadian rock musicians often had to make the decision to relocate to the United States. Burton Cummings from The Guess Who is a Canadian musician who still expresses his "Canadianness" in his music, yet resides in Los Angeles (King 2006).

northern Ontario, were faced with unique challenges due to their geographic location. In the early 1970s, musicians from this area were eager to record, yet limited in terms of access to recording facilities. The nearest professional or production studios were more than 800 kilometers away in Toronto.¹³ Travel and studio costs were prohibitive. Because of the lack of facilities, northern musicians and technicians who had a passion for music, collaborated to create the “project studio”. Project studios generally catered to amateur or semi-professional musicians who could not afford production studios, yet desired high-fidelity recorded products. Therefore, the project studio evolved out of necessity for the musician. Homes or office buildings were converted into project studios that were filled with scrounged materials and recording equipment.¹⁴

Because many northern communities are isolated to begin with, project studios were crucial to the development of the Canadian recording scene. Prior to the advent of the project studio, cash-strapped musicians were unable to record in professional surroundings. Professional production studios were too expensive for the average musician unless they were supported by a major label. Production studios, such as, those operated by the Canadian Broadcast Corporation

¹³As an amateur musician living in Timmins it was difficult to record at the professional level. Until the advent of “the project studio, specifically Greg’s, [Greg Vintar] we [in Timmins] did not have access to any good studios. If we wanted to record at Metalworks [Toronto], we would have to pay high hourly rates, hotels, food and fuel. It simply was not worth it” (Grenville 2006).

¹⁴After speaking with several engineers active in the 1970s, I began to realize the importance of the project studio for amateur musicians, especially in isolated northern regions. Project studios could be found in various isolated areas across Canada. These studios are not well documented, because they generally exist in private homes.

(CBC) were generally reserved and booked solely by high paying record labels such as RCA and Universal Records.

Prior to the evolution of the project studio in the 1970s, musicians often left Canada to record a demo or full length album.¹⁵ However, following the introduction of the CanCon regulations, engineers, such as Greg Vintar of Timmins, Ontario, and Rob Jardine of Thunder Bay, Ontario were encouraged by the demand for Canadian recording products and thus created project studios.¹⁶ Vintar's first project studio, called *Ice House*, was located in Stratford, Ontario, and housed in a building that used to be an ice house. Here, Vintar "would record and rehearse material that was to later be performed at the Stratford Music Festival" (Vintar 2006).

Rob Jardine, a technician and project studio owner, was similarly affected by the CanCon regulations. Jardine, a sound tech for *Thunder Sound and Lighting* and tech for the *Thunder Bay Community Auditorium*, became affiliated with the CBC in the early 1970s. Because of the CBC's continual need to upgrade their recording facilities, technicians such as Jardine were able to purchase used equipment and start their own project studios. The roles and benefits of the

¹⁵Bobby Curtola, a Thunder Bay native, was not able to gain access to a professional studio, nor make the connections to sign with a major record label, therefore he formed his own label named *Tartan Records*.

¹⁶Not only were studios created due to rising technology and CanCon quotas, but pioneers such as Bernie Finkelstein, virtually created independent music. In 1969, "when Finkelstein hatched the idea of *True North Records*... There were exactly none [independent record labels]" (Wagner 2006). Since then, Finkelstein's label has released "more than 400 albums, racking up 39 gold and platinum records and 38 Juno Awards" (Wagner 2006).

project studio will be discussed throughout this thesis.

THE NATURE OF A NATIONAL SOUND IF IT EXISTS IN ROCK MUSIC

In this section, I have raised controversial matters surrounding the expression of Canadian identity in rock music. I am aware that some may disagree with my views. From a purely timbral perspective, a national Canadian rock sound does not exist within the confines of rock music, but I suggest that regional soundmarks do exist which give regional particularity to Canadian music. This may include characteristic compositional methods, instrumentation and orchestration, originating from a given area in Canada. In turn, these characteristics are all influenced by what technology is available and how musicians in that area have heard the technology being used.

It is important to understand the Canadian rock scene in the 1970s and its social dimensions to properly comprehend the changing role of sound recording in Canada. The CRTC and CanCon regulations sparked a demand for rock musicians, technology, studios and record labels.¹⁷ The increasing number of Canadian rock musicians inspired technicians and musicians to create project studios, and encouraged production studios to experiment and invest in new

¹⁷Controversially, some artists, including Edmonton rockers, Retrograde, feel that the CanCon regulations hurt Canadian artists. Retrograde's drummer, Ben Hulse says that "the content mandate [CanCon] is not helping up-and-coming Canadian artists anymore... With so many internationally successful Canadian rock bands out there now, it actually makes it harder for independent bands like us to get radio play. We're all competing for the same spots, so with people like Theory of a Deadman and Nickelback eating up the airwaves, there's not a lot of room for independent hard rock bands like us (Moroz 2006).

state-of-the-art technologies in order to compete with the American market.

MY ROLE IN THE MUSIC INDUSTRY

Because nothing has been written on the recording industry as such in northern Ontario, this thesis largely draws on my own experiences and information obtained through interviews with musicians and engineers from that area.. I have been fascinated by the music industry for a long time. At the age of eleven I began formal musical training on the electric guitar. A year later I began performing in the local schools of Timmins, Ontario, with an amateur rock group. Shortly thereafter, I was drawn to the world of popular music when my brother and I established the power rock trio Midnight.¹⁸ The success of this group led to a sizable tour (The Reality Tour), which was sponsored by the Ontario Provincial Police. The tour, through the use of video and live musical performance raised awareness of the dangers of substance abuse.

As a teenager, I became interested in classical guitar and theory, which prompted me to study classical guitar with world renowned guitarist and professor Philip Candelaria. He inspired me as a performer and recording artist, and influenced my evolving musical philosophy. At this point in my life, both classical and popular music captured my interest and constituted my musical landscape. I was convinced that recording was an essential element in all genres of music. By the age of fifteen, I became interested in the processes of digital recording. Because of limited financial resources combined with the isolation of Timmins, I decided that home

¹⁸Midnight included, Barry Promane - lead vocals, keyboards and bass -, Dave Promane - lead guitar, backing vocals - and Joel Helin - drums -. This group performed both cover songs and original material in Timmins pubs and regional high schools.

recording was the only practical option for our band, Midnight. We began experimenting with digital software in our basement, and soon after, in 1994, released our first single, entitled “In The Sky.”¹⁹

At the age of nineteen, I enrolled in the Bachelor of Music program at Carleton University in Ottawa. While pursuing a Bachelor of Music degree, I spent eight months of the year as a classical musician studying with Stephen Rollins, while my summers were spent touring the country as a rock musician. For four years, I toured with the group, Stone’s Throw. Over the course of these tours, I accumulated a wealth of knowledge of music industry standards, technical assiduousness, and social engagement. Musically, I shared the stage and toured along side various Canadian performers, among them, April Wine, Kim Mitchell, Sass Jordan, Honeymoon Suite and Jeff Healey. Following several personnel changes, Stone’s Throw regrouped under the name, Promane, and in 2004 recorded a full length album at Pebble Studios in Ottawa. The completion of this album led to an extensive cross-country tour sponsored by Molson Canadian. The tour consisted of thirty-six shows commencing in Ottawa and concluding in Whitehorse, Yukon.

My interest in sound recording and the methodologies that constitute its makeup was spawned through practical engagement within the industry in conjunction with academic study. I had the opportunity to work at Pebble Studios as a Practicum placement in connection with my

¹⁹*In the Sky* was recorded using digital software, Sound Audio Workshop (SAW). The computer operating SAW was connected to a 24-channel Peavey mixing console.

studies at Carleton University. There, I experienced the world of recording first-hand. Following this experience, I began researching theoretical and practical concepts for examining the Canadian recording industry. After years of experiencing the music industry, I wanted to examine it in some detail by applying practical models.

At times this thesis becomes technosyncratic due to the nature of my research findings. I have chosen only the innovations and methodologies that I feel best describe the evolution of recording technology. It is impossible to mention every device used in recording technology or studio methodology in a work of this length.

The Canadian recording industry is comprised of a complex web of technologies and organizations which include: the media, equipment or *gear*, consumers, audiences, the Internet, studio personnel, and of course, the musicians. Over the past four decades, the academic literature has seldom kept pace with the transformations taking place within the Canadian recording industry, simply because of the rapid rate in changing technology that denotes the contemporary scene. This is an ongoing problem because of the need for contemporary information on this developing field within cultural studies, Canadian studies, sociology and music. Academia has frequently failed to document the recording industry within a specific genre of music. This thesis examines technologies used within Canadian rock music. Studio technologies and recording methodologies used within rock music are often shared with other genres of music, but the rock genre is distinct in regards to instrumentation and specific recording practices. These will be discussed throughout this thesis. Rather than focusing on one

specific element within the Canadian recording industry, I have chosen in this thesis to paint a picture of the entire Canadian rock recording industry as reflected in specific recording techniques, studios, and technologies.

The thesis is divided into five chapters to describe the evolution of the recording industry and its effects on rock musicians and their audiences. Chapter One provides a general outline of various technologies that account for monumental points of transformation in the rise of sound recording from initial experimentation to modern digital practices. This outline serves as a guide for the reader to understand epochs, key figures, and rhetoric.

Throughout Chapter Two, project and production studios are compared by exploring the contrasting technologies and methodologies used within each. Following several discussions with Canadian engineers who have worked in Canadian studios throughout the 1970s, I realized that engineers categorize Canadian studios as project or production studios. To my knowledge, Canadian musicologists have not made this distinction nor listed the processes used within these two archetypes.

Technological changes, including the rise of digital technology in the 1990s, have enabled the practice of home recording to develop. Chapter Three discusses the advent of home recording as it relates to the aspiring musician. Home recording is a relatively new process, and few musicologists have considered the impact of home recording on the musician. Digital technology has transformed the recording industry by enabling aspiring amateur musicians to

record in the privacy of their own homes without the high costs of professional studios.

Throughout Chapter Four, I analyze the relationship between the musician and the recorded product. I have created a model to describe the various routes that musicians may take in their quest for success. This diagram serves as a guideline for the reader to properly understand the political economies that impact on the music industry. The average consumer is unaware that musicians are often influenced and controlled by a hierarchy of studio personnel and record label officials. The role of these officials and their effects on musicians will be examined.

Chapter Five documents the life of Greg Vintar, a project studio owner in Timmins, Ontario. Throughout his life Vintar has experienced many of the changes discussed throughout this thesis. Vintar has made a unique contribution to the Canadian rock scene. His contributions to the Canadian recording scene have hitherto lacked documentation because of his location in a remote northern Ontario community.

Throughout this thesis, I will demonstrate the significance of these factors which have generated a shift within the Canadian recording industry, and explore in particular how it has affected the musicians. Canada is a unique nation with an arguably unique approach to sound recording; Canadians have adopted a range of different recording methodologies that reflect the geographic diversity and expanse of the country. Digital technology, including home recording has enabled Canadians in remote locations to record and share their regional sounds

internationally. Through the use of modern digital technologies Canadian musicians have become more independent and aware of the restraints and controls that powerful record labels can exercise over them. For most musicians, whether signed to a major record label or as an independent artist, their goal is to retain as much creative control as possible. Retaining such control is a difficult task and often leads to defeat. Understanding the history of the Canadian recording business and the evolution of the technical process can provide musicians with invaluable knowledge, and increase their chances of success. This history begins with an exploration of the roots of Canadian sound recording.

Chapter 1

THE RISE OF SOUND RECORDING

Since the beginning of Canadian sound recording, no one has properly documented the technologies and methodologies used within Canadian recording studios. A limited history of sound recording does exist on internet sites and in Jackson's *Encyclopedia of Canadian Rock, Pop & Folk Music* (1994). Jackson discusses an abundance of Canadian artists and their recordings, yet he does not examine the technologies responsible for creating these recordings. Moogk has also documented Canadian recording artists in his *Roll back the years: history of Canadian recorded sound and its legacy ; genesis to 1930* (1975), yet this work is limiting because it only discusses Canadian recording artists up to 1930. Throughout this chapter, I will provide a historical background on the technologies responsible for sound recording, specifically in the rock genre. Although I intend to focus on Canadian technologies and recording methodologies, sound recording did not originate in Canada, therefore some of my historical analysis will be from abroad.

IN THE BEGINNING

The roots of present-day sound recording can be traced back to the invention of the phonograph in 1857 by the French inventor Léon Scott de Martinville. This device did not

produce sound but rather reproduced a recorded wave on a soot covered cylinder.²⁰ Twenty years after Martinville's invention, American inventor Thomas Alva Edison produced a working model of what was called a 'talking machine.' This device recorded and indented sound waves on a tinfoil covered cylinder making it possible to playback a recorded audio excerpt. Edison's talking machine was demonstrated at Rideau Hall in Ottawa on May 16, 1878, for their excellencies Governor General Lord Dufferin and the Countess of Dufferin (*Ottawa Citizen* [Ottawa] 16 May 1878). Although Edison's invention seemed to be revolutionary, it did not have a practical commercial use and thus remained unused for some time. Approximately a decade later, Edison created a wax cylinder that imparted a higher fidelity sound quality in recorded materials. Part of this new recording technology included Edison's graphophone, which was bought and manufactured in 1887 by the American Graphophone Corporation (The David Sarnoff Collection 2002).

Emile Berliner's 1887 invention of the gramophone made recording music a commercial practice (see Appendix A, Illustration #1). Berliner envisioned that a flat disc recording device could operate by a lateral side-to-side method rather than the vertical 'hill and dale' pattern on which a cylinder operates (The David Sarnoff Collection 2002). This mode of production required the making of a master copy which then enabled any number of copies to be generated, without deterioration in sound quality. This differed from cylinders, which degenerated rapidly,

²⁰The phonautograph "made a visual image of sound waves on a cylinder, but did not play or reproduce any sounds. [Léon] Scott used a horn to collect sound, a diaphragm at the end of the horn that vibrated from the sound, a stiff brush bristle attached to the diaphragm, and a rotating cylinder covered with lampblack or blackened paper that recorded the wavy lines from the vibrating diaphragm and bristle" (Marco 1993, 615).

and allowed only a limited number of duplicates to be made from the original source. The gramophone was the first device that had the capability of producing sound recordings in mass quantity.

Due to copyright threats in the United States, Berliner took his gramophone to Canada in 1897 to obtain a patent (Moogk 2006). In that same year, Berliner established a recording company in Montreal named Berliner Gramophone.²¹ Shortly thereafter, in 1900, he produced the first Canadian made disc recording. These recordings were first produced on 18cm (7-inch) shellac discs, followed by 25.5cm (10-inch) in 1901 and finally by Deluxe 30cm (12-inch) discs in 1903 (Théberge 2001).

From 1889 to 1925 there were few changes in recording techniques and technology. In 1919, two former Royal Air Force officers from Ontario named Lionel Guest and Horace Owen Merriman began experimenting with electrical recording using a microphone.²² Up to this point, both flat disc and cylindrical recordings had trouble capturing high and low range frequencies; they were only capable of recording central mid-ranged tones. With the use of microphones and electronic recording, Guest and Merriman were able to capture bass and treble sounds that had previously been unattainable. Unfortunately, many of the larger recording companies at this time

²¹The Berliner Gramophone company was “the first record company in Canada and the manufacturer of ‘Gram-O-Phone’ records and talking machines” (Moogk 2006).

²²Their new invention was first demonstrated at a ceremony for the burial of the Unknown Warrior in Westminster Abbey on November 11, 1920. An original print of this document is available at Library and Archives Canada (Théberge 2006).

did not show much interest in this new electronic means of sound recording. This lack of interest was due to large inventories of acoustic recordable discs held by recording companies.

By 1925, these companies were given no choice but to switch to electronic recording in order to compete with other companies and maintain sound quality for radio broadcasting. Electronic technology enabled mobile recording at various locations rather than strictly within the confines of a studio setting. The portable Guest/Merriman technology was the forerunner of both the home studio and live single-tracked analogue recording. With the advent of this technology, new jobs and positions were created within the music industry. The position of the sound engineer was perhaps the most important as it demanded both a well trained ear and technosyncratic skill. The role of the sound engineer was to work alongside the musician in order to produce a product that was marketable and sonically appealing.

Magnetic recording was one of the biggest advances in sound technology.²³ Although magnetic recording technology evolved during the Second World War, a combination of technical and economic problems prevented its commercial use until 1948. Magnetic recording enabled reel-to-reel tape production and made the long-playing (LP) record a reality. Reel-to-reel magnetic recording enabled the production of not only better sound quality, but an extension in length and duration of the recording, which had previously been a mere three to four minutes per

²³Magnetic tape rapidly evolved following WWII. Magnetic tape recorders enabled multitrack recording and remain “the principal means of recording music in professional studios, the home and automobile” (Daniel, Mee & Clark 1999, 1).

side of a disc.²⁴ This technological advancement provided performers with the ability to record detailed and diversified repertoires. With the adoption of magnetic tape the role of the sound engineers yet again shifted, accentuating their function as editors.

The use of magnetic tape was further developed with the advent of ‘simul-sinc’ recording. This employed a modified tape recorder that allowed the recording and synchronization of individually performed tracks on magnetic tape. Electric guitar and multitrack recording pioneer Les Paul, along with the support of Bing Crosby experimented with and created one of the first multitrack recording devices. After encountering a German tape recorder - the first recording device to use magnetic tape - Paul “elaborated on the basic design and created a device that allowed him to layer (multitrack) parts” (Soylent Communications 2005). The recorded result of Paul’s creation was a complex eight-guitar piece entitled *Lover*, in which Paul played all eight parts himself. *Lover* was released on Capitol Records in 1947 as the first commercial release of a multitracked recording. Coincidentally, around the same time, scientist and electronic music pioneer Hugh LeCaine of Ottawa, Canada, had developed a much more sophisticated multitracking recording device called the variable speed/special purpose tape recorder (see Appendix A, Illustration #2). LeCaine’s device not only had the ability to multitrack record, but it was also able to record and playback at variable speeds. Unfortunately, the variable speed/special purpose recorder was never commercialized.

²⁴Magnetic tape enabled engineers to use an infinite amount of recording time. Unlike the record, which was limited to four minutes per side, additional tape could be added on reel-to-reel machines until the recording was complete. Reel-to-reel recording magnetic tape, should not be confused with the cassette tape, which consumers use to play recorded materials.

EARLY LIVE OFF THE FLOOR RECORDING

From the beginning of sound recording, “live off the floor” was the standard method for capturing audio. During a live off the floor recording session, musicians would perform their songs directly into a recording device. This method of recording was especially important in the early days of sound recording but still remains widely used today.²⁵ The live off the floor technique enabled sound engineers to record in both live venues and studios. Although live venues were practical for consumers and performers, sound quality was inconsistent due to fluctuating variables that were uncontrollable. A controlled sound environment enabled sound engineers to achieve a higher recording quality. Early studios consisted of both a live room (where the performers would be stationed) and a control room (where the sound console and engineer would be located).

In any form of sound recording microphone positioning in relation to both instruments and performers is critical. Prior to 1925, recording devices offered little room for manipulation. Sound engineers began changing the architecture within the studio in order to have an acoustically controlled room. “Sound effects” were not yet feasible, therefore distinct rooms were constructed in order to achieve the desired sound or effect. A vocal room, for example,

²⁵Although live off the floor recording may be used in any genre of music, it is particularly effective within the rock genre. In personal conversation, engineer James Mongeon, expressed his belief that “live off the floor recording makes the timbres of all the rock instruments blend together and unify. Live off the floor adds realism to the recording and makes things sound ‘live’... This is why engineers continue to use this method of recording” (Mongeon 2006).

generally consisted of a natural reverberation, hence a room with hard walls and natural echo would be desired. Sound engineers became adept at using many rooms and engineers experimented with everything from bathrooms to long empty hallways.²⁶

Problems with microphone positioning remained a constant challenge. Before multitrack recording, several instruments would be recorded simultaneously. This situation created problems in trying to capture the distinct sound frequencies of each medium. If an instrument such as a tuba produced a low frequency and was recorded at the same time as an upper registered instrument such as an alto saxophone, the sound quality of the two instruments would be distorted and lost. In order to deal with this situation, sound engineers studied the physics of sound and began placing instruments in the studio in a similar arrangement to an orchestra. Generally, bass, tenor, alto and soprano instruments were placed in groups. Depending on the recorded material, louder instruments would be placed further away from the microphone in order to achieve a unified volume balance. This enabled the various timbres of each respective instrument to be heard with sonic clarity. Not only was this an effective method for recording orchestral music, but it was also suitable for smaller groups such as folk and country musicians. Before multitracking, it was not possible for each instrument to be recorded independently, so achieving a balance when working in mono - recording using only one microphone - relied heavily upon studio craft and ingenuity.

²⁶Engineers, particularly from project studios made use of virtually every room in their home in order to achieve a desired effect. Project studios were known for using scrounged materials and unconventional locations in an attempt to capture unique tones.

MONOPHONIC RECORDING

The technology produced by Canadians Lionel Guest and Horace Owen Merriman was the first means to enable electronic recording. As mentioned above, Guest and Merriman used a new electronic technique of recording involving a microphone. Prior to the advent of Merriman and Guest's microphone technology, a gramophone with the use of a stationary recording device produced the highest quality of sound production.²⁷ The use of microphone technology enabled level adjustments and also favored transportability. This means of recording used a single microphone and the sound was recorded onto one single track. The performer in the studio setting would be situated in the isolation booth with the microphone, which would transmit sound waves to the recording device.

Once the performed material was captured by the single microphone, a master tape would be made by the engineer. The nature and quality of the final recorded product -were determined by the location of the performer in relationship to the positioning of the microphone, the dynamics of the performer, and the structure of the room.

STEREOPHONIC RECORDING

In April of 1930, Leopold Stokowski, a recording pioneer, invited Bell Labs to begin experimenting with his Philadelphia Orchestra. At this time, Stokowski was recording

²⁷The gramophone consisted of a large sound emitting horn, diaphragm, needle and wax cylinder and /or record. When audio waves were produced by the performer, the diaphragm would transmit the frequencies from the performer to the needle. The needle would then impress the sound waves onto the cylinder or disc (How stuff works 2006).

monophonically and was not pleased with the sound quality. After a series of disappointing broadcasts of his recorded orchestra on the National Broadcasting Company (NBC), Stokowski decided that something had to be done in order to improve the quality of sound recording in general. At the Academy of Music in Philadelphia, Stokowski worked with Arthur C. Keller and Bell Labs in order to change the face of recording.

[Keller] installed a vertical-cut recorder equipped with a new moving coil pickup with sapphire stylus that extended the dynamic range to 10,000 cycles. Surface noise was reduced by coating the wax master with gold film and a layer of electroplated copper, and making the duplicate release copies pressed on cellulose acetate rather than shellac (Schoenherr 1999).

In March of 1932, Bell Labs produced several test recordings using two microphones connected to two styli, cutting two tracks on the same wax disk. Later that month, Stokowski recorded his first stereophonic album entitled *Poem of Fire* by Alexander Scriabin. This recording is the earliest surviving example of stereophonic recording.

The basic means of producing a stereophonic recording is similar to that of monophonic recording, although the primary difference can be noted in the manner in which the disc is cut. Monophonic recordings were produced by cutting a V-shaped groove with a laterally-oscillating stylus. This imprints grooves in a wavy shape. Once the record is pressed, it is played back on a turntable. The pickup head contains a stylus (needle), which is conical in shape with a spherical tip. The stylus traces the various grooves on the recording. This motion is then translated into electrical impulses by means of an electromagnet. The electrical impulses are strengthened by an amplifier, and then reconverted to sound through a speaker (Pepin 1998).

Stereophonic recording operates largely on similar principles. The difference between the two is that stereophonic recording uses a laterally and vertically-oscillating stylus, while monophonic recording uses only a laterally-oscillating stylus. The stereo cutter head has two complete electromagnetic mechanisms arranged in such a way that they apply each channel of sound to a common stylus. Therefore, since the groove is V-shaped, it is possible to have two grooves in one. Each side of the "V" represents a different channel and has a distinct wave pattern, which is picked up by the stylus. A stereo stylus operates in the same fashion as the mono stylus, although it is much more sensitive (Pepin 1998). Stereophonic recording enabled sound engineers to produce virtual sound. Virtual sound refers to having different mixes on both the right and left sides of the playback device. Engineers experimented with placing certain instruments on only one side of the final mix.²⁸ Their experiments were inspired by the fact that human beings hear in stereophonic sound because of the placement of their ears.

Sound engineers and musicians were constantly probing for new sound patterns and microphone placements in order to achieve a higher quality recording. Microphone placement techniques differed considerably from one instrument to another. These often depended on the personal preference of the sound engineer. Nevertheless, the end result could be drastically altered by simply changing the position or angle of the microphone. Similar to monophonic means, stereophonic methods of recording were effected by the architecture and layout of the recording room.

²⁸This technique is commonly referred to as ‘panning.’ This technique can be heard in the introduction of The Tragically Hip’s *New Orleans is Sinking*. In this example the rhythm guitar is placed (or panned) on the left side, while the lead guitar is on the right.

MULTIPLE MICROPHONE TO TWO TRACK MIX

By the early 1940s, multiple input consoles became more readily available, and thus the engineer-controlled mix was born (Théberge 2001). The engineer was now capable of controlling various levels among groups of instruments. Although an individual mix for a certain instrument was possible, if one were recording in stereo, the final output to the recording device would only be a left/right mix. A separate mix was simply not possible because both tracks were needed to record in stereo and thus an individual mix could not be obtained. The entire performance and recording method relied upon the live off the floor technique. Each instrument was recorded using an independent microphone, yet one or two microphones for a group of instruments remained the standard. A single microphone technique was often used for recording one solo guitar, for example, but not for an ensemble such as a brass trio. Mix was one of the most important aspects of the master recording. Thus in order to test the recording mix, it was necessary for several test discs to be tracked. These were referred to as “scratch tracks.” The assessments by the engineer of the scratch tracks allowed for the adjustment and positioning of both performers and microphones in an effort to achieve a balanced mix.

MAGNETIC TAPE RECORDING

New technologies made many existing technologies obsolete. Shellac discs initially introduced a higher fidelity sound, yet lost their fidelity the more they were played. Magnetic tape was initially introduced during the Second World War. For economic reasons its commercial availability was not made possible until 1948. The advent of reel-to-reel magnetic

tape recording not only imparted better sound quality, but also enabled performers to choose from a diversified repertoire. Before reel-to-reel tape recording, audio recordings had time constraints. Shellac records, which were the standard before 1948, were limited to no more than four minutes per side. The LP record, which had a twenty-three minute recording capacity per side, did not become available until 1948; therefore tape production allowed artists to record a wider repertoire of music including major classical works (A Brief History of the Vinyl Record 2006). For sound engineers, the advent of tape recording was the biggest advancement in recording to date. For the first time “musical recordings could be edited and assembled, much like a film, from a series of short ‘takes’; the result was a new kind of perfection in both musical performance and the art of recording” (Théberge 2001).

SIMUL-SYNC RECORDING

Pioneers were quick to test the limits of reel-to-reel recording. As indicated earlier with the song *Lover*, Les Paul along with performer Bing Crosby experimented with a German recording device in the mid-1940s and altered the mechanics of the machine enabling it to record a track while playing back the previously recorded track. This was the first commercial demonstration of a multitrack recording device. Meanwhile in Canada, the variable speed tape recorder, developed by LeCaine enabled musicians to be recorded onto separate tracks of magnetic tape; later tracks could be recorded, altered, and mixed onto a single track. It was this technology that blossomed from two-track recording, to eight, sixteen, and then twenty-four.

By 1954, Ottawa physicist and composer Hugh LeCaine was creating a more

sophisticated device, “The Special Purpose Recorder.”²⁹ This machine, which arguably could be considered an instrument, was “capable of altering the playback speed of several recordings simultaneously, through a keyboard” (Ford & Young 2005). His machine was revolutionary, and in many ways, was more advanced than the simul-sync recorder created by Les Paul.

As technology evolved, Studer created the A80 (see Appendix A, Illustration #3) which was one of the most advanced reel-to-reel decks. The function of the deck was to amplify the microphone’s sound and transfer it onto a reel-to-reel magnetic tape. Models such as the Studer A80 enabled two-track stereo recording by attaching a head unit, which acted as a pre-amp in each input channel. The version of the A80 shown in Appendix A functioned at 19, and 38 cm per second and recorded onto 1/4 inch tape. It was a heavy machine and was comparable to the cost of a new car in the 1950s. The A80 was also notable for its ability to do on the spot editing. Editing was a four-step process. First, the sound engineer would cue the spot that needed editing. The tape would then be marked with a marker (see Appendix A, Illustrations 4 and 5) (1 in Illustration 3) or a soft white pencil. The tape was then moved (2 in Illustration #4) to the tape cutter (3 in Illustration #4) and then cut. The engineer would play on to the next spot where the mix should continue, and repeat the editing process. On the top of the editing unit there was a small ridge (4) which was exactly 1/4 inch wide. It was in this ridge that the engineer would line

²⁹In 1955, with the use of the special purpose machine, Hugh LeCaine was able to record his landmark piece, *Dripsody*. This piece “is based upon the single sound produced by the fall of a drop of water. This is developed in all manner of ways plain and fancy scales, played with a neat, pearly perfection any piano virtuoso might envy; bell tones of several kinds; long sustained pure tones; and mixtures of these several elements” (National Research Council of Canada 2006).

up the two ends of the tape that had been cut, and apply a special splicing tape to finalize the edit.

MULTITRACKED ANALOGUE RECORDING

With the advent of multitrack analogue recording, the inventions of Les Paul and Hugh LeCaine set the standard within the recording industry. The multitrack era of recording began with the fabrication of a four-track recording console. In 1957-8, RCA created a recorder with a super-compact tape head that stacked four heads in the place of the pre-existing two; thus allowing a stereo tape to be flipped over and played on both sides. Initially, sales of these four-track recorders failed due to the fact that four-track tapes could not be used on any of the standard two-track machines. It was due to “this lack of compatibility, combined with the high price of stereo tapes, [that] discouraged sales” (A History of Sound Recording Technology 2005). Early four-track recording was not seen as practical, but a select group of studios began exploring its employability. Once the machine’s versatility and accuracy became commercial, it was an instant success.³⁰

Four-track recording enabled a group to record on four separate tracks, therefore opening

³⁰Four-track recording enabled musicians in isolated areas on limited budgets to multitrack a record without paying the costs associated with recording in professional studios. Randy Alberts describes the benefits of the Tascam four-track recorder: “The Tascam deck was good enough to make records on, and my partner JJ Jenkins and I would cut a stereo recording of a band live to two of the four tracks and use the two remaining channels to overdub solos or vocals later...Our secret to making our recordings successful [on a limited budget] was to bring our four-track session tapes to local pro studios to mix” (Alberts 2003,1). Having recorded products professionally mixed and mastered was common among project studio engineers.

the possibility of recording in a more accurate and controlled fashion. Initially, groups were interested in only recording vocal tracks separately from the instruments. The reason that this method of recording was desirable was due to microphone bleeding. Microphone bleeding refers to a microphone picking up undesired sounds from another instrument. This was problematic for sound engineers as the clarity of the voice became distorted due to background noise. With the advent of the four-track recorder, vocals could be recorded at a different time than the rest of the band, thus eliminating background noise. Multi-sync recording enabled vocalists to hear previously recorded material through headphones. This drastically reduced background noise and enabled engineers to work with the human voice minus impediments.

Multitrack recording also opened the possibility of recording four separate tracks monophonically. Although stereophonic recording was becoming standardized, some engineers continued to use a mono style of recording, and thus experimented with four separate mono tracks. Nevertheless, stereophonic recording remained the standard throughout the 1960s until the present day. Due to the enhanced sound of stereophonic recording, engineers used two of the four tracks for final levels and had two tracks to use freely. Generally, engineers recorded vocals on a separate track along with a solo instrument, in order to achieve a good balance of levels.

The era of multitrack recording gave birth to what was coined the *mix down*. Once a product was recorded to the desired quality, the engineer played back the recorded piece and altered its levels; hence the mix down. The benefit of a mix down is its ability to accentuate desired instruments at any given time throughout the performance. For example, during a guitar

solo the sound engineer may want the overall volume of the guitar to be raised. Controlled volume and dynamic edits were now manageable due to the mix down. Before the final product was recorded to the master tape, the engineer would allow the song to play and when the guitar solo approached, the engineer could raise the level and then immediately lower it at the end of the solo. Such adjustments by the engineer could be made throughout post production prior to the making of the master tape.

THE EXPLOSION OF MULTITRACK RECORDING

With four-track technology, engineers continued to record in an acoustically controlled atmosphere. The multitrack studio of the 1960s and the early 1970s expanded quickly due to commercial demands for higher quality recordings³¹ (see Appendix A, Illustration #6). Throughout this era, the role of the sound engineer contributed so much to the final product, that he was regarded as the nucleus of the production. Engineers were responsible for controlling the console and recording devices, while producers were responsible for alterations and modifications to musical compositions. A talented individual could often act as both engineer and producer. Throughout the 1960s and 1970s engineers not only repaired virtually any piece of equipment within the studio but also created new recording devices so that their facilities could be one step ahead of the competition. As studios struggled to achieve a proper mix through a four-track console, various engineers utilized the principles of the four-track console

³¹Generally, musicians, specifically within the rock genre embraced the editing qualities of multitrack recording. Some genres, including punk, rebelled against multitrack recording. The punk genre arose in the late 1970s “as a reaction to the pretentiousness of studio-bound progressive rock, musicians insisted on doing recordings in one take to create the sense of a live performance experience” (Starr and Waterman 2003, 322).

and elaborated them in order to achieve eight tracks. By the mid-1970s a 24-track console became the standard for sound recordings within most professional studios.

With the ability to record with a 24-track console, engineers were able to record sections of instruments and ensembles independently. Although 24 channels sound like an abundance of individual tracks for a rock band, certain instruments benefit from the use of several tracks/microphones. Drums for example, may use as many as 15 individual tracks, due to the various components and placement of the drum kit. Several Canadian drummers, including Neil Peart from the power trio Rush, use a drum kit to its full capacity. Peart uses percussive instruments including wooden blocks, gongs and rock drums to produce his unique timbre. Because Peart uses such a large drum kit, several individually tracked microphones are required.³² With the ability to capture instruments with several microphones, engineers could control every detail of each instrument or voice. Engineers were able to control all aspects of equalization, volume, and effects within the master mix. In order to record each instrument separately, various isolation rooms were needed. These rooms reduced the risk of microphone bleeding and also facilitated overdubbing - recording additional parts alongside (or merged with) previous tracks - when desired. To record an overdub, a controlled atmosphere was used to create a realistic sound, therefore, the more controlled a room is sonically, the easier overdubs were achieved.

³²Throughout the 1980s, Neil Peart pushed the limits of the live mixing console by using “back-to-back electronic and acoustic kits on a revolving riser” (Nicholls 1997, 75).

The principles of live off the floor recording were still applied, although not in the same manner. Although most groups continued to record their material in a live setting, live off the floor recording was not done in the same room. Many groups wanted to capture the live feel of their material, yet did not want to contend with issues of microphone bleeding. This form of recording led to what is known as 'bed-tracking'. Bed-tracks are basically the same as scratch tracks, because bed-tracks are a rough take of the overall piece being recorded. These tracks are done at the beginning of the studio session and permit the performer to hear whatever track they feel is necessary in order to adequately record their individual track.

Therefore, the early technique of having several microphones in the studio room and recording the entire song live, was still being used to capture the bed-tracks. Generally, the instruments chosen to be heard by the musician were a matter of personal preference. With the ability to bed-track along with independent channels assigned to each instrument on the recording console, the engineer was able to record and overdub countless times until a near perfect performance was achieved. The engineer could also alter the individual acoustic characteristics of each room for each performer. After the main material of each master instrument was recorded, solos and other background instruments could be recorded. Frequently, a rock band multitracked in the following order: drums, bass, guitars, keyboards, guitar/other instrumental solos, lead vocals, backing vocals.³³ Once all of these elements had been recorded,

³³From my own personal experiences working in studios, the order of recorded instruments provided above is most commonly used in the rock genre. Professional groups including April Wine and Nickelback use a similar sequence of recording (Schultz 2006). This method of recording is suitable for amateur and professional recordings, providing that sufficient tracks are available on the recording console.

effects and equalization was then added and adjusted to the preference of the band, engineer and producer.

As sound engineers became more accustomed to the general uses of the 24-track multitrack recording console, some sought to record groups on more than 24 tracks. For large production shows, including classical and theatrical works, more tracks were required. A technology coined 'the 48 lock-up' enabled engineers to record on 48 different tracks (Mongeon 2005). The 48 lock-up operates by taking two 24-track tape recorders and linking them together in order to work simultaneously. This method enabled sound engineers to record large scale works in a live concert setting or in a controlled studio setting. When recording large scale works in a live setting a single microphone was generally used for each major section, and a separate microphone for all of the soloists. By 1987 digital and analogue technologies began working together producing what was called a DAT (digital audio tape). At this time, the concert would be recorded on a DAT tape and then mixed in a recording studio using digital technology (see Appendix A, Illustration #7). DAT tapes were able to record each track individually rather than as a final master mix and therefore were editable post recording.

Prior to the advent of digital recording, multitrack analogue recording possessed everything needed to produce a high fidelity commercial recording. Although many recording studios have turned to digital media for sound recording, numerous studios employ analogue technology to thicken the frailty often produced by the perfections of digital sound. Consequently, an amalgamation of both analogue and digital media often produce the best final

results.

THE ROOTS OF DIGITAL RECORDING

Digital recording began in 1972 when the Nippon Columbia Company of Japan introduced a digital audio converter. This technology used a process called pulse code modulation (PCM) and a standard video recorder, which placed digital data onto magnetic tape. Although it was used in 1972, it was not made affordable until 1978 with Sony's introduction of the more compact PCM-F10. In order to commercialize their product the PCM encoder/decoder used a standard Betamax video deck, although generally any video deck would work. By 1981, Sony released the second generation of the PCM-F10 called the PCM-F1 which reduced the processor size substantially. The analog to digital and digital to analog (ADC and DAC) chips developed for the F1, were the forerunners to the compact disk player.

Because digital technology operated on a binary system, it made sound recording easily editable. Digital recordings could be stored and edited using computers with an unprecedented degree of precision that was simply not possible with the use of magnetic tape. By the late 1970s, digital editing had a significant impact on the recording industry, consequently professional studios began mastering LPs using digital technology. Throughout the 1980s, many

important recording studios in Canada, including Metalworks³⁴ began to specialize in digital audio technology.

Prior to digital technology, the LP record and the audio cassette were the primary methods of audio playback and distribution. The Philips Company of the Netherlands invented and released the first compact audio cassette in 1962. Cassettes “used high-quality polyester quarter inch tape produced by BASF... [playing back] at a speed of 1.7/8 inches per second” (Inventors 2006). The next year, sales of the cassette tape within the United States escalated due to the advent of the Norelco Carry-Corder cassette dictation machine. In the late 1980s audio cassettes became highly commercialized and as a result of the Sony walkman, sales of the cassette tape began overtaking those of the vinyl LP.

The *digital revolution* is believed to have started with the commercialization of the compact disc. The compact disc (CD) was initially created in a joint effort in 1982-3 by Philips in Holland and Sony in Japan. The format of the CD was based “on a small-format video disc technology (originally developed during the 1970s); the medium offered music listeners an increased dynamic range and freedom from the annoying surface noise of older recording formats” (Théberge 2001). CDs became commercialized in 1985, but only seven plants were

³⁴Established in 1978, Metalworks “was originally a creative workspace for the legendary Canadian supergroup Triumph. ... Metalworks expanded over 25 years into a six studio powerhouse, and today ranks as Canada’s consummate world-class studio facility” (Metalworks Studios 2006). Canadian stars including, Sum 41, K-OS, Tom Cochrane, Rush, Our Lady Peace, Tea Party, Billy Talent, David Usher, Anne Murray and Nelly Furtado demonstrate the studio’s relationship with Canadian talent.

making them world wide. By 1987 thirty-five plants had been built, and soon after CD sales began to surpass the sales of the LP.

Although the medium of recording began changing from LP to tape to compact disc, the method of recording remained similar. High quality, open reel, multitrack tape machines continued to be used. The change from analogue to digital initially occurred in the editing and mastering suites rather than directly in the recording process. Common to all forms of studio technology discussed thus far, digital technology within the studio began to appear in both tracking units (consoles, effects) and also in the form of DAW (digital audio workstations) for editing.

AMALGAMATING DIGITAL AND ANALOGUE TECHNOLOGY

By the mid-1990s studios were able to produce fully digital recordings for the first time, using ProTools, a complete digital recording program. Invented by Peter Gotcher, ProTools contained all the necessary tools to track, edit, record, and even mix a recording. ProTools operated on a powerful computer that used a multitude of ‘farm cards.’ These ‘farm cards’ were a form of computer chip that supplied DSP (digital signal processing) engines and additional resources, thus removing the stress of processing from the computer’s CPU (central processing unit) (Mongeon 2005). They are installed as hardware directly inside the computer.

In 1984, personal computers were in the early stages of commercialization. Digidesign’s founders, Evan Brooks and Peter Gotcher, developed a product called ‘digidrums’. This

program took actual drum samples and turned them into digital signals which were then functional without a physical drum kit. During this time, computers and music were still considered an obscure combination. The medium of tape recording, which had been the standard, still reigned supreme as did analog devices ranging from razor blades to massive recording consoles. Due to the many years of analogue tradition and experience, its use was not withdrawn but rather linked with digital technology.

Not only was the digital means of recording expanding, its influence was seen in the production of instruments as well. Due to their affordability, electronic instruments began appearing in studios and on stages everywhere. In 1983, the first electronic keyboards with MIDI were introduced. Midi (Musical Instrument Digital Interface) is a form of communication that enables electronic instruments such as the synthesizer, sampler, sequencer, and drum machine to communicate with one another.³⁵ This technology paved the way for increasingly powerful and sophisticated computer-based music systems. With the capability of digital and analogue technology, the merging of personal computers, and electronic/digital instruments became acceptable. Digidesign's ProTools was the first program to intermix midi, digital and analogue technologies to produce a high fidelity sound with editing capacities.

Although ProTools set the foundation for digital recording, it was not until the development of Creation Technology's 'Otari RADAR I' that the first 24-track hard disc based

³⁵Ralph Dyck at a home studio in Vancouver built in 1972 the first sequencer which allowed numerous synthesizers with monophonic capabilities to be attached. In 1977 his invention was purchased by the Roland Company (Keillor 2002, 310).

recorder became a reality. In 1994 Creation Technology produced the RADAR I 24-track hard disc recorder, the first to become commercially available. This system was intended to replace open reel-to-reel machines.

The innovations of digital recording facilitated editing, recording and mastering. The principle of the overdub, which consisted of cutting tape and replacing it with a new take was gone. By having the ability to record on a hard drive, with the simple click of a button, sonic recorded material could be discarded or removed. It became clear to engineers and studio managers everywhere, that the medium of hard disc recording could be operated at a fraction of the cost. This was due to the fact that tapes were usable only when recording a project, while a hard disc was erasable and recyclable without the loss of sound quality. After the initial creation of the RADAR I, many companies began manufacturing similar products and slowly turned the recording world on to a digital means of recording technology.

Digital technology was produced in a binary format (using ones and zeros) and as a result sometimes sounded too perfect. With the use of magnetic tape, flux and imperfections are inevitable, thus recordings sound more realistic and similar to live performance. On the other hand, digital recording is flawless and does not offer a fluctuation in sound. Generally, recording was meant to sound real and not overly produced. With all digital technology, if the engineer desired, she or he could make a product sonically perfect through technological manipulation. Many consumers did not approve of this flawless and synthetic sound. Therefore, engineers used traditional forms of analogue recording, including reel-to-reel and analogue pre-amps to capture

the warmth of the analogue sound but used the editing, tracking and mastering capabilities found only in digital recording.³⁶

Subsequently, many aspects of digital recording have blossomed and have made the home digital recording studio affordable and a reality. A vast amount of digital recording software has become available around the world. Although the digital versus analogue debate is an ongoing concern amongst engineers, the fact remains that in order to produce a great recording, knowledge, dedication, and a large budget are still a necessity.

The evolution of sound recording and its technology are largely responsible for the variety of studios now available in Canada. The following chapter outlines the roles of the production (professional) studio and the project studio. Production studios such as the Canadian Broadcast Corporation (CBC) studios have been present in Canada since 1936, yet the technologies and methodologies used within these studios have not been thoroughly documented. The project studio, a studio created by musicians for musicians, is a phenomenon that academia has failed to document. Project studios have helped musicians in isolated northern regions record and disseminate their products. Prior to the project studio, due to high costs, musicians

³⁶Amalgamating digital and analogue technologies was a common practice in professional studios, but became critical to isolated northern studios. Timmins musician Dean Grenville explains: “When I was experimenting back about 10 years ago with recording, I used a computer, a twelve-channel recording console, and some analogue gear... Then I got Cubase (computer recording software), sometime around 1998, and I remember being very impressed by how easily I could record and edit tracks. I no longer had to cut and play around with tape. Everything was right in front of me on my computer screen... It makes recording for us northerners much easier” (Grenville 2006).

without a lot of money were unable to record in professional recording facilities. The functions of the production and project studio will be examined throughout the following chapter.

Chapter 2

CANADIAN STUDIOS FROM 1970 TO 1990

Following the CanCon quotas implemented by the CRTC in 1971, Canadian musicians scrambled to record and fill Canadian airwaves. In the early 1970s there was a demand for Canadian musicians, technology and recording studios. This chapter will outline the benefits, technologies and recording methodologies used within the production and project studio. American production studios have been documented by individuals such as Morton (2000) and Cogan and Clark (2003), yet specific recording technologies and practices within Canadian production studios have not been documented.³⁷ Academia has failed to document the project studio and its benefits to isolated northern communities. This chapter identifies specific technologies and recording practices used within the project and production studios. Chapter 5 further describes the project studio by documenting a specific studio in Timmins, Ontario.

CANADIAN STUDIOS FROM 1970 TO 1990

During the 1970s, the majority of Canadian recording studios were not the large corporate-driven structures we think of today, but rather small project studios. The leader in

³⁷David Morton's *Off the Record: The Technology & Culture of Sound Recording in America* (2000), "traces the development of audio-recording technologies, from wire spools to eight-track and DAT tapes, paying special attention to those that are available to the individual consumer" (McNamee 2006). Cogan and Clark's *Temples of Sound: Inside the Great Recording Studios* (2003), also analyses American production studios by providing an in depth look at the most powerful studios in the United States. This work provides anecdotal contributions from the producers, engineers, and artists who made these studios unique.

production studios at this time was the Canadian Broadcast Corporation (CBC). The various CBC studio locations throughout Canada recorded television and radio broadcasts in a variety of genres and styles, depicting the diversity that defined the Canadian mosaic. On occasion, professional rock musicians recorded in CBC studios, although the rock genre did not have an exclusive facility that supported its sonic architecture. Genre-specific recording required the use of specialized equipment, knowledgeable studio personnel, and acoustically pure surroundings. The rock genre itself embraced a range of sonic idiosyncracies which included: distorted guitar amplification, pounding drums, driving bass, and processed vocals. When contrasted with a genre like folk, which is predominantly characterized by a quality of purity exemplified in the use of acoustically-based instruments and non-processed vocals, the need for a different recording approach becomes evident. The methods used for capturing the timbral distinctions within each genre differed considerably from one another. Sound engineers developed microphone technologies and microphone placement techniques within acoustically fixed rooms to capture the traits that typified rock music.

Prior to the project studio - a small studio generally established by recording enthusiasts at the semi-professional level - major Canadian production studios, including the CBC, were preoccupied with recording rock groups who had achieved professional status and, in many cases, were funded by major labels. Consequently, aspiring musicians were left without a place to record their musical creations. If amateur Canadian musicians wanted to attract attention from major labels, they required a recorded product which inevitably necessitated a substantial financial investment. Due to their high hourly rates and their exclusive professionally-based

structure, production studios were out of reach for the majority of amateur musicians who sought fame. Yet, before the project studio, production studios were the only outlets available for Canadian rockers wanting to record.

In the early 1970s, many of the major Canadian record labels owned their own recording studios or rented space from the CBC. As a reaction to this reality, amateur musicians and technicians established their own studios, which became known as ‘project studios.’ Former engineers from major studios such as Capital and RCA banded together in order to establish project studios.³⁸ These engineers possessed experience and talent, while maintaining faith in individual musical rights and creativeness that the independent musician symbolized. Independent musicians and engineers wanted an environment that was free of corporate manipulation and unreasonable cost.³⁹

Engineers formerly employed by major production studios were able to acquire used equipment from these studios that they refurbished and repaired for usage in project studios.⁴⁰ Production studios were constantly evolving and upgrading equipment in their quest to maintain

³⁸Stuart MacArthur, a professional engineer from Canada’s Studio A, became an active member in establishment of the Canadian project studio. MacArthur worked at various project studios throughout the ‘70s recording many Canadian bands including B.B. Wolfe (MacArthur 2005).

³⁹As previously discussed, in the 1970s Canada’s leading recording studio, Metalworks, served as a creative workspace for Canadian rock group Triumph. Clearly, even Canada’s largest production studio began as a project studio (Metalworks 2006).

⁴⁰Based on personal communications with project studio owner/operators Rob Jardine, James Mongeon and Greg Vintar, it appears that many project studios engineers have created their studios almost exclusively from refurbished equipment.

contemporaneity; the resulting turn-over of equipment acted as a resource for independent project studios that wanted to obtain professional equipment at a reasonable cost.

THE PROJECT STUDIO

Throughout the 1970s, Canadian recording studios were either project studios or production studios. The home studio, as we know it today, did not exist due to technological limitations of the time, although its function is synonymous with the project studio. Both home and project studio environments foster comfort, creativity and musical freedom, never imparting the high level of intimidation and competitiveness that is inherent in the corporate production studio.

Generally, project studios were constructed in pre-existing structures (i.e. barns, homes, office spaces, and garages) which were modified accordingly. Studio personnel who built the project studios did not have the funding available to construct professional, acoustically-sound structures, but they were incredibly resourceful, exploiting their resources to the fullest degree.

James Mongeon (see Appendix A, Illustration #8) of Soundwise Productions explains:

Old office spaces were very common [for conversion]; unfortunately most office spaces were at a premium for cost... Another example is converted homes. Something that started out as a little basement studio would eventually take over the entire house. Mr. Vintar [Greg Vintar of Timmins, Ontario] is a prime example. You would also see a lot of this in farm country because you didn't get a lot of traffic, so you didn't need as much soundproofing... I have seen a lot of barns and farm houses converted; they are ideal (Mongeon 2005).

Structural Modifications

Once a suitable location was found, engineers and fabricators began experimenting with methods of sound-proofing in an attempt to maximize recording quality. Undoubtedly, studio builders were on a limited budget; therefore major structural modifications were not feasible. Due to cost restraints, studio personnel experimented with foam lining and egg cartons to obtain a sufficient degree of insulation.⁴¹ Sound dampening created sonically-controlled environments which were, and still are today, compulsory for the rock recording aesthetic. In this exploratory phase, engineers discovered that placing heavy blankets on the walls enhanced the desired result. In addition, the door of the studio posed a challenge for insulation due to its sound leakage. One inventive solution was to use equally sized stacked bottles which were separated by felt, cardboard or cotton and bound tightly together. The layer of material between the bottles prevented rattling and other sonic disturbances. The door was often modified and lengthened in order to accommodate the size of the bottles. The amount of space between, and within the bottles, directly effected the quality of sound produced within the recording room. In many instances, engineers were not satisfied with the dampening quality of a single door and added a second. The additional door was hung approximately six inches in front of the existing door to create a sound dampening zone. Sound waves traveled through the first door and became trapped and confined within the space between the two doors. Today, this primal innovation remains a standard in almost all professional studios throughout Canada.

The materials used to create the studio floor assumed an equal degree of importance with

⁴¹In 1994, my brother and I experimented with recording in our parents' home. We collected large egg cartons from local restaurants and stapled them to the ceiling in an attempt to insulate our live recording room.

those used on the studio walls. The floors within these rustic structures were often made of hardwood or concrete. Hard materials caused frequencies to rebound and ricochet, therefore in most instances, floors were sanded and insulated. In the case of wood, the hard clear coating was removed to permit sound absorption. In other circumstances, thick shag carpeting was placed on the hard surface to create dampening. Yet another example of resourcefulness was the use of carpet underlay. In the 1970s, residential contractors began placing foam underlay beneath carpeting to add comfort for homeowners. Studio personnel realized the material's potential as an insulator and began using it throughout the studio, including the floor, walls, doors and ceiling. This method of insulation continues to be used in home studios today. It is effective, inexpensive and comparable to materials used in production studios.

During this period project studio builders began experimenting with a new structural concept referred to as 'a room inside a room.' Fabricators created a wood frame, attached it to the concrete foundation of a basement, added insulation and covered the inclosure with dry-wall. This technique was essential for project studios built on and around a concrete foundation. The 'room inside a room' technique was also used for constructing drop-ceilings attached to existing floor supports for the room above. This process was important because it eliminated vibrations that might have seeped through from the upstairs floors.

'Floating walls' were another device used to ensure the utmost sonic isolation within the recording room. This technique required the construction of a secondary wall in front of the existing wall. Aluminum plating, foam, and insulation were placed between the two walls to

create a ‘floating gap’, thus avoiding direct contact and vibration between the walls. Drywall and wood were not directly fastened to the concrete or existing walls, but rather were fastened to pieces of aluminum and insulating devices between the walls.

Sound insulation was an important aesthetic component of the project studio, the creation of which was, and still is, regarded as an art form unto itself. It was a process of trial and error that consumed the lives of musicians and technicians in their quest for achieving an environment that embraced sonic deadness and control, allowing them to utilize their creative talents not only through their music, but through the innovative methodologies that were explored within recording techniques.

The building of an acoustically sound room was the most important aspect of the studio’s design, and was integral to the “live off the floor” method of recording. Using inexpensive equipment and materials, insulated rooms were regarded as the linchpins of the project studio. Design and acoustic structure, in conjunction with knowledge and craftsmanship, attained greater importance than expensive equipment within the project studio. The physical attributes found within project studios were vital to their sonic architecture. Barns were ideal structures due to their high ceilings, which created natural reverberation. Uneven walls, which were common in most barns, were an asset in creating sonic dampening. Rather than giving sound waves the opportunity to travel and bounce freely off squared surfaces, such walls eliminated and controlled unwanted sound refractions. Walls in modern production studios are angled anywhere from three to ten degrees, depending on the degree of dampening sought. Studio builders have borrowed

this concept from theatres, along with several other structural ideas.

Sound is a wave and travels in an arc; because sound is round, it may bounce off objects and rebound in an abundance of directions. Sound may continue to travel after striking a wall, yet with the use of angled walls, sound waves are redirected into dampening zones specifically crafted for stopping deflective waves. Square walls, on the other hand, do not cause sound waves to lose their velocity; rather sound bounces indefinitely creating reverberation and noise. This principle may be exemplified in long hallways that are constructed of hard materials, such as concrete. For example, if a person were standing at one end of a hallway and speaking softly, the projected sounds would seem to be at a higher volume and distorted. Sound waves travel from a projected source and bounce off the walls and floor, thereby gaining volume and velocity while losing tonal clarity.

With this knowledge engineers were able to adjust the audio dynamics within the project studio without the use of expensive frequency testing devices. Trained professionals were able to isolate problematic frequencies using their own ears. When sound was projected at a moderate volume throughout the project studio and a ringing in the ear developed, this was an indication that there was a problem with a particular frequency. Ringing may be caused by the angle of the walls, ceiling structure, or the use of certain materials in the construction of the studio. Frequency-related problems were often caused by the presence of hard materials such as concrete floors, or high ceilings that have not been properly dampened. In order to rectify problematic tones, builders added unfinished wood and foam baffles throughout the studio. As previously

stated, hardwood does not promote sound dampening, yet softwood such as, pine, cedar and spruce are efficient in providing sound dampening.

Equipment

Throughout the 1960s, the most widely used recording module (or console) in Canadian production studios was the API 500. By the 1970s recording technology had advanced at such a rapid rate, that government organizations were forced to place such obsolete consoles in storage. With the right social connections, however, project studio personnel were able to obtain these used government consoles. The API 500 and other similar consoles were not the massive structures seen in contemporary studios, but rather consisted of a few pre-amps without equalization.⁴²

Since the majority of rock recordings in the early 1970s were tracked by using the live off the floor method of recording, the quality of the console greatly affected the caliber of the recorded product.⁴³ Although multitrack recording was used by a few production studios in the 1970s, project studios did not have access to multitrack magnetic tapes and tracking consoles. Project studios often used two-track or four-track recording consoles. The use of a four-track console enabled the engineer to use two channels for a stereo master mix and the remaining two

⁴²Pre-amps were simply electronic strips on the console that enabled the connection between an instrument and recording device.

⁴³Throughout the 1970s, the CBC studios favored MCI recording and live consoles. Greg Vintar and Rob Jardine are two project studio owners who were able to acquire used MCI consoles from the CBC.

for overdubbing guitar solos and vocals. This method of recording may be considered multitrack recording, yet this term generally refers to recording a large number of players or an entire group on individual tracks. Engineers continued to experiment with recording methods to enable the use of a greater number of tracks on a small console. This led to a technique referred to as “bouncing the tracks.”⁴⁴ Bouncing the tracks enabled the engineers to maximize the use of a small console. This technique of bouncing the tracks also allowed engineers to conserve magnetic tape.

Magnetic tape was available in a variety of sizes: half-inch, quarter-inch, one-inch and two-inch were the standards, ranging in recording capacity from single track mono to twenty-four track stereo. The cost of magnetic tape varied in relation to track capacity and length. Throughout the 1970s twenty-four track tape recording was used only by major studios with large budgets. The most commonly used tape for semi-professional, amateur or even professional studios was two-inch sixteen-track magnetic tape (Vintar 2005). Two-inch tape was affordable and had multitracking capabilities ideal for the project studio of the late 1970s. On the other hand, small amateur studios used half-inch tape due to its low cost and ability to record two, four or eight tracks on a single piece of tape.

Technological Advancements

⁴⁴I got the term ‘bouncing tracks’ from Timmins engineer James Mongeon who defines it this way: “Often project studio engineers would record a group using a three-track mix, then re-record this mix onto the one remaining track. In other words, you dump everything onto one track and then you have three more to play with. This method is great for anyone who wants to make the most out of a small console” (Mongeon 2005).

In the 1970s the emergence of new audio suppliers offered economic viability for independent consumers. Companies such as Soundcraft made the project studio more effective and affordable by creating precision consoles at a fraction of the cost of those found in production studios. Soundcraft's first console to change the market was the S1 (see Appendix A, Illustration #9). This particular console was revolutionary because it was one of the first commercial consoles available with British EQ (equalization). British EQ enabled the user to modify four different bands of EQ including the high, presence, mid and bass. As this unit evolved, the presence and the mid became the high-mid and low-mid, while also becoming "sweepable." In the early days of on-board EQ, companies used pre-set equalization; this technique consisted of simple circuitry that gave each pre-set EQ selector its own set of capacitors and resistors. The selector switch was a multi-position rotary switch with click stops, while sweepable EQ altered equalization settings in a smoother manner without the use of stops. The sweeps were composed of circuitry that contained a predetermined frequency range that the rotary potentiometer made sweepable. George Massenburg, the engineer largely responsible for creating sweepable EQ explains:

Our (Bob's [Meushaw], Burgess' [Macneal] and my) sweep-tunable EQ was borne, more or less, out of an idea that Burgess and I had around 1966 or 1967 for an EQ that would avoid inductors and switches, both expensive and seemingly flawed items in that day. In 1964 or 65 we had built a console for Recordings Incorporated of Baltimore that utilized the first Fairchild monolithic IC's [integrated circuit], both 709's and 716's. The performance was woefully inadequate, and our later designs were built around discrete-transistor op-amps (Massenburg 2005).

Many years of experimentation and manufacturing were required to perfect this sweepable EQ; thus, this system of equalization did not become commercially available until the

late 1970s. Soundcraft used this feature on its Soundcraft S-2 (Series Two) console that became available in the late 1970s. Before the advent of on-board EQ, the only method of altering the equalization of a specific instrument was by experimenting with different microphones, pre-amps, and amplifiers.⁴⁵ British EQ enabled engineers to edit problematic frequencies prior to placing them on tape, which was more cost efficient and provided a sonic clarity that was previously unavailable. Soundcraft was in competition with companies such as Trident and Tascam who also used on-board equalization. The Tascam Series-10 (see Appendix A, Illustration #10) from 1974 offered “features found in far more expensive mixers. One unique feature of the Model 10 (8x4) mixer was that it was designed to be expandable”(Tascam 2005). This meant that additional features and channels could be added to a pre-existing console, while on-board equalization was also available. James Mongeon, a member of the Audio Engineering Society (AES) explains the importance of this console:

The Tascam Series 10 (labeled under the Teac name) were great consoles during the 1970s; even by today's standards they perform adequately. For their time, in a project studio they were fantastic. Actually, one of them was recently retired from a teaching studio at Lakehead University. It was purchased from Lakehead by a friend, then I got it... It is currently in about 65 pieces in my storage unit, waiting for rebuild. I am restoring all of it and getting it back into service. This console has had some modifications. The previous owners added transformers so they could have balanced I/O's (input and outputs). That's one of a number of reasons I want to restore this unit. We also have a Tascam M15B that came out in about 1981, if I remember correctly, hanging around the studio. A lot of these old workhorses are still worth working with. You just can't seem to kill these things. And contrary to modern equipment, they are easily serviceable (Mongeon 2005).

⁴⁵Project studios in isolated regions of Canada did not have the money or access to professional studio microphones. Therefore, project studio engineers experimented with different microphone positions in order to maximize sound fidelity without purchasing new equipment.

The equipment used in project studios throughout the 1960s and 1970s was gathered primarily from production studios. In contemporary studios, as explained by Mongeon, northern project studio owners continue to gather equipment from large corporate entities.

Processed Sound Effects

Sound effects as we know them today, did not exist in the early stages of Canadian recording. Throughout the 1960s, reverberation units were not commonly used in project studios due to high fabrication costs. Natural reverberation was often created by recording in halls, churches, or recording rooms with high, properly angled ceilings. Reverberation is created by sound waves deflecting and bouncing off various sources before reaching the human ear or recording device. Natural reverberation is ideal for recording, although impractical for many studios due to their controlled and dampened sonic architecture. Project studio engineers experimented by using different rooms for capturing natural reverberation, including bathrooms, hallways and kitchens.⁴⁶ For additional information regarding reverberant sound fields and processed reverberation, see Appendix C, #1.

Audio Bussing

“Audio bussing” is a term derived from the electrical engineering term *bus bar*, which is

⁴⁶Project studio owners experimented with different rooms in their home in order to obtain sufficient levels of natural reverberation. Several musicians from northern Ontario, including myself, have experimented with the natural reverberation produced in St. Alfonsus Church, Schumacher. The late Father Les Costello, Toronto Maple Leaf star and priest, encouraged music and recording by allowing aspiring musicians to use his church for sound recording and rehearsals.

“a rigid power supply conductor to which several connections are made” (FOLDOC 2005). In terms of audio sound engineering, the bus works as an assignment path to a point of output such as off-board effects processors. All makes of consoles were equipped with at least one output bus, which was the mono output. On modern consoles, a minimum of two outputs may be found, thus creating one stereo output. On consoles from the 1950s and 1960s, there was generally only one mono output. By the 1970s, consoles were equipped with two or more stereo outputs, and acquired *sub groups* and *audio groups*. These extra buses were generally used for live consoles rather than studio mixers. In order to better understand the concept of audio bussing, the mixing console will be explained in greater depth.

Understanding the Console

The mixing board, or audio console is an ensemble of microphone pre-amplifiers, equalizers, auxiliary send mechanisms, faders, output busses, master sections, and metering systems, all of which are accessible through patch bays (see Appendix B, Illustrations # 2-7). The console is essentially the master control system of all audio devices in the studio. To better understand the terms and concepts listed above, the following is an example of an audio source and the path it follows through the various systems used in the recording process. This example will illustrate the audio path that is incurred when microphoning a guitar amplifier.

Initially, a quarter- inch patch cable is placed in the guitar’s output which is sent to the input of the amplifier. A microphone is then placed in front of the amplifier by the engineer in an appropriate location. The microphone is then connected to the console’s input patchbay in

channel #1 via XLR cable, which is a three- pronged cable with a male and female end, generally used to attach microphones to a console.

The guitar then produces sound waves that are transferred from the guitar to the amplifier, which are then picked up by the microphone and sent to the console. Once the signal reaches the console, the microphone signal is amplified by the microphone pre-amplifiers. The signal is then introduced to various off-board components, such as equalizers, dynamic control, and filters before going into the busses. At this stage there are several possible busses: the auxiliary busses (aux send), the master bus, group bus, and record bus. All of these busses have the purpose of sending the signal received from the channel to a different modifying device; by and large these devices are effects processors. The auxiliary send busses are used to send the signal from the audio track (i.e. the guitar sound taken from the amplifier) to off-board devices such as reverb and delay units. The group busses are used in order to combine specific channels from the console so that they may be manipulated as one. This is commonly used for drum tracks; drums are to be set and adjusted on individual channels and then sent to a group in order to adjust them as one entire unit. This method is ideal for live recording, especially for adjusting the volume of an entire drum kit without disturbing the pre-set mix. This is also effectively used for background vocals. Rather than raising or lowering the channels of all of the background vocalists, they are adjustable as a whole by raising or lowering the level of a bus.

The master bus, much like the group bus, constitutes the final grouping of the channel strips. This arrangement of channels acts as an ensemble of one master rather than several

individual channels. The recording busses are an important aspect of the recording console and cannot be found on most live mixers. In this case the busses are assignable outputs that are located directly on the channel, rather than off-board. They enable the engineer to send the output of the channel to any of the bus outputs on the patchbay (see Appendix A, Illustration#12). A patchbay is simply a device that routes and manages all of the audio signals and processors that are sent from effects units into the console. The patchbay is connected to the recording device; engineers, for simplicity's sake, match the record bus to the recording device.

Thus, to clarify, the record bus #1 is connected to the input channel #1 of the recording device. The return (or output) of the recording device will then be attached to the corresponding line-in of the console. The recording bus allows the engineer to assign any of the incoming audio channels to any channel on the recording device to simplify mixing. Accordingly, the guitar that was patched through on channel #1 of the console can be re-assigned to a different channel on the console in order to accommodate the engineer once the mix is complete, without moving any of the cables from the console or the patchbay. This enables the engineer to choose the location of this particular guitar track to facilitate the final mix. This method is also beneficial for the engineer to know and recall where every track is without constantly re-patching into the system.

Audio compressors (see appendix A, illustrations 13 &14), which can be found off-board, were an essential tool in the studio, functioning as a leveling and amplification device. A compressor applies dynamic control to an audio signal in order to maintain a higher decibel level on the master product. Additional information regarding the audio compressor and its functions

can be seen in Appendix C, #2.

THE PRODUCTION STUDIO

The major corporate studios in Canada, specifically the CBC, hired architects and acoustic engineers to fabricate soniferous structured rooms for recording and broadcasting. Unlike the project studio, which consisted of a modified space, production studios (see Appendix A, Illustration #15) had rooms built using advanced techniques that properly contained sound waves within the given structure. In order to build acoustically specific structures, a large sum of money was required.⁴⁷ Production studios were built in large spaces such as airplane hangers or warehouses that were modified accordingly to accommodate the studio facilities.

Production studios generally consisted of three to four rooms or separate studios, which allowed for the recording of several artists simultaneously. Each individual studio consisted of a control room, where the engineer and the control equipment such as the console, compressors and equalization were stationed, while the band was located in the main recording room. Each artist required a slightly different set-up due to audio idiosyncrasies; therefore a large main room was needed to accommodate musicians. The main room was often divided into smaller sections by cubicle-like structures, similar to dividers found within office buildings. Although these cubicles were not entirely effective for dampening sound, they acted as slight barriers by

⁴⁷Greenhouse Studios in Vancouver, British Columbia, is one of the most renowned Canadian production studios. It is a massive, multi-million dollar complex that features three individual recording studios. Greenhouse Studios has recorded Canadian superstars such as Nickelback, 54-40 and the Barenaked Ladies.

dampening sound to a degree that facilitated live off the floor recording.

The production studio had a much larger live or main room (see Appendix A, Illustration #16) than the project studio. This was not only because production studios were able to afford large rooms, but large live rooms made set-up easier for established bands and promoted natural reverberation. Despite the fact that these rooms were constructed to isolate sound, dampening was still possible through the use of shifting walls and movable wooden boards.

Isolation rooms (see Appendix A, Illustration #17) became more prominent during the 1980s with the increase in use of multitrack recording. Isolation rooms were constructed directly off the main floor using materials such as underlay and dense foam to achieve maximum sonic dampening. Bands that used the live off the floor method of recording used isolation booths for vocalists, to reduce or eliminate ambient noise. Isolation booths were especially important in recording rock music because of high volume produced by each individual instrument. Tube amps were driven to their limits to achieve a warm tone, thus bleeding into surrounding microphones. Engineers were able to use isolation booths effectively by sending audio in real time through headphones to the vocalist. This manner of recording enabled engineers to capture a precise clarity in vocal tone while using either live off the floor or multitrack methods. Engineers using multitrack recording had little problem with ambient noise, since only one instrument was tracked at any given time.

Multitrack recording was not commonly used in rock music during the 1970s and early

1980s in Canada, as engineers preferred the sound of live off the floor recording with the addition of overdubs. Overdubs were generally used for adding additional guitars and vocals that were not possible to capture in the initial live sessions. A greater sense of authorship was demonstrated by bands who were able to perform every track on their own album without hiring studio musicians to perform the additional parts. With the advent of overdubbing and multitrack recording, Canadian rock groups such as April Wine, were able to create a symphony of guitars on their albums with very few performing guitarists.⁴⁸ They often used two or three rhythm guitars with four guitars playing contrapuntally, thus creating a symphonic effect. Although it was difficult to perform live, they were able to show their musicianship and the capabilities of modern multitrack recording. In live performance, especially in the arena rock genre (see Appendix A, Illustration #18) of the 1970s and 1980s, leaving out additional instrumentation was an easy task. The acoustics in arenas were terrible because of their steel fabrication and hard floor surface; thus subtleties that may have been audible on a studio album were lost within the sonic density of live reverberated performance.

The Physical Structure of the Production Studio

The Audio Engineering Society (AES) played an active role in aiding acoustic engineers to design the overall structure of their studios. Acoustic sound engineers were the dominant figures in creating the architecture and design of the production studios, but members of the AES were essential for interior fabrication. The structure of the production studio was similar to the

⁴⁸April Wine, led by frontman and composer Myles Goodwyn, performed countless guitar tracks in order to produce symphonic guitar orchestration. Their multitracked guitar work can be heard on hits such as *Roller*, *21st Century Schizoid Man* and *If You Believe In Me*.

architectural design of large professional theatres. For hundreds of years, theatres have been designed with angled walls and sound projecting/deadening devices to ensure that audio waves are projected in a controlled manner. The theatre's structure has acted as a model for the modern day studio.

Unlike the project studio, production studios used angled walls and sheets of glass. Sheets of glass were placed between the control room and main studio live room to act as a visual aid for the musicians and producers. Walls were constructed at three, five and ten degree angles, depending on the desired dampening envisioned by the engineer. In modern studios, three-degree angles are most commonly used, while in the 1970s, five and ten degrees were considered the standard. Although engineers believed that a greater angled wall served as the ultimate solution to sound reduction, extreme angles proved to be ineffective due to sound-pockets. These pockets are physical locations within the studio where sound waves become trapped. This occurs within the corners of two heavily angled walls; therefore, angles of five degrees or greater were considered problematic. After years of experimentation and modification, three-degree angled walls became the angle most commonly used within the production studio.

While carpeting and underlay were the predominant materials used for sound deadening in the project studio, the production studio used state of the art insulation fabrics. Wall coverings consisted of dense drywall, high pressured foams, semi-rigid foams, and fabrics made out of corrugated canvas. Baffle divisions were made out of a foam inlay with pine framing. In modern

studios, plank foam or ester foam is the most recognized dampening material. These high density foams were available in the 1970s, but very expensive.⁴⁹

Canadian production studios began experimenting with alternative methods of sound dampening by using angled windows between the main room, control room and studio doors. Various angles were used on the glass (see Appendix A, Illustration #19) depending on the design of the room. Two pieces of glass were used in a single window frame with a space or sound trap left between the two sheets of glass. The pieces of glass were angled in opposite directions, thus deflecting sound waves. The door used to divide the control room and main room was constructed using two doors similar to the structure used within the project studio. Production studio engineers bolted a hollow wooden door on top of a metal door; the wooden door was placed on the side closest to the musicians in the main room, while the metal door was placed next to the control room. In some cases, the hollow door was padded with plank foam to further deaden ambient sound.⁵⁰

Equipment

The equipment used in Canadian production studios was almost unlimited in terms of quality and quantity. Canadian studios were in competition with the big five (Universal Music

⁴⁹Companies now use these materials in the fabrication of cases to protect instruments and electronics while on the road.

⁵⁰The experimentation of sound recording carried on eventually impacting other areas of Canadian life. For example, similar to the recording studio, modern homes began using hollow metal doors with baffling to keep out extreme temperatures and noise.

Group, Sony Music Entertainment, EMI Group, Warner Brothers Music, BMG Entertainment) from the United States. Canada, with major studios such as Metalworks in Toronto and Greenhouse Studios in Vancouver, was able to take a lot of business away from American corporations. Throughout the 1980s and 1990s, major bands such as Aerosmith, Guns N' Roses, and AC/DC came to Canada to record, not only to capitalize on the exchange on the dollar, but also to use state-of-the-art technology in some of the best studios in North America..⁵¹

In the 1980s, the British company, SSL (Solid State Logic), created a console that not only had on-board compressors, but also had individual compressors available on each channel. EQ drastically changed within the production studio in the 1980s. Large amounts of equalization were available on each independent channel, and racks of additional EQ became available off-board. Off-board rack mounts, (see Appendix A, Illustration #20) were simply effects units, compressors or equalization that were separately linked to the console to modify the timbres of each instrument. This was convenient due to their portability, enabling a console to have an abundance of interchangeable effects.

By the 1980s, professional studios were no longer concerned with acquiring the most expensive equipment, but sought the highest fidelity equipment instead. Companies such as Neve, Trident, SSL, and A.P.I. were all in competition with each other to engineer the best

⁵¹The following groups and individuals have left their home countries to record at Metalworks Studios in Toronto, Ontario: Prince, Tina Turner, David Bowie, The Cranberries, D12, Guns and Roses, N'Sync and Christina Aguilera. Also, film stars Catherine Zeta Jones, Rene Zellweger, Steven Segal, Richard Gere (Metalworks Studios 2006). Greenhouse Studios in Vancouver has recorded international rock stars AC/DC, Bon Jovi and many others (Greenhouse Studios 2006).

available consoles, disregarding price and striving only for quality. Throughout the 1980s, consoles were often custom built by the engineer. In order to construct these consoles, pre-amps were purchased to power the console, followed by the addition of custom equalization. This was unique because various forms of EQ were available. Engineers were able to customize EQ in various forms, for example, four channels of British EQ, three channels of four-band parametric EQ, five channels of tilt EQ - a simple form of high and low EQ - and the rest of the channels could have been left without EQ. This was convenient and practical to suit the individual needs of the studio engineer.

Microphones were one of the most important pieces of equipment in the recording studio. Although microphones held a high degree of importance in the project studio, production studios used much more expensive microphones that produced a higher clarity of timbre. Such microphones ranged in cost from \$500 to \$20,000. For additional information regarding the evolution and specific models of microphones used within the production studio, see Appendix C, #3.

Digital Technology

Digital technology drastically changed the face of the recording industry. By 1990, many of the most illustrious Canadian studios began using digital effects and digital computer software. Computer software amalgamated digital and analogue technologies, creating an easily editable product while enabling the smoothness of analogue textures. Many studios in the early 1990s were criticized for using solely digital means of technology for the recording process.

Digital sound technology produced a fragile sound texture because digital formats operate using ones and zeros rather than a pure sound wave. Therefore, engineers began experimenting with amalgamating digital and analogue technologies. The concept of fusing digital and analogue technology and digital software will be explored in depth in the following chapters.

This chapter has documented the recording methodologies, physical structures and benefits of both the production and project studios. As documented above, the project studio is important especially for musicians in isolated northern regions of Canada. The project studios aid financially stricken musicians and serves as an outlet for the recording and dissemination of recorded goods. In thinly populated areas where access and cost prohibit recording in production studios the project studios are especially important. As outlined above, production studios produce higher fidelity products than project studios, yet are expensive and only found in densely populated areas in Canada.

The home studio is a relatively new form of recording that has spawned from home computers and digital technology. The home studio helps artists in isolated areas of Canada transmit their products internationally. These studios are beneficial for musicians who wish to document rehearsals or produce a demo recording without paying the high costs of professional recording. This digital technology and its impact on the rock musician, particularly in remote regions of Canada, will be explored in the next chapter.

Chapter 3

HOME RECORDING

Technology has been rapidly evolving since the beginning of sound recording. Throughout the 1970s and '80s, Canadian musicians, specifically those in isolated regions of Canada, were enthusiastic about project studios. By the early '90s home computers and digital technologies spawned a new form of recording that was affordable and easy to use. Although home recording is a relatively new phenomenon, it has been highly beneficial to musicians wanting to record demos and document rehearsals.⁵² While home recording is convenient for the aspiring musician, it can not produce the high fidelity products that are comparable to those of the project and production studios.

EARLY HOME RECORDING

Home recording began with the use of tape decks and microphones to record amateur groups for the purpose of documenting musical material. The progressive development of technological devices extended the singularity of monophonic recording, enabling home enthusiasts to use equipment that combined high density memory capabilities with layering functions.

⁵²Home recording has many benefits for aspiring musicians, particularly in isolated communities. According to Milstead, with home recording you can “work much faster, easily edit waveforms [digital recorded files], cut and paste...and keep all of your work in the pristine fidelity of the digital domain... [you can] achieve audio quality that ten years ago was possible with only the most expensive equipment available” (Milstead 2003). Digital technology and home recording have helped musicians in isolated regions of Canada to achieve a high fidelity of sound at their convenience.

With the advent of portable reel-to-reel recording decks, rock musicians began recording rehearsals on tape through small consoles. The consoles served a dual function by “getting [an] instrument’s signal to the multitrack tape deck, and mixing the recorded tracks into stereo” (Greenwald 1992, 17). Similar to project studios, home studios were used by musicians who did not have a large budget.⁵³ Many artists used inexpensive equipment including a basic two-track console and tape decks. As musicians became more accomplished and technology more accessible, the home studio evolved, enabling cost-conscious consumers to produce adequate demo products from their homes.

DIGITIZING IN THE 1990s

Prior to 1991, digital recording was not commonly used due to insufficient technology, minimal availability, and high cost. In 1991, Alesis revolutionized the recording industry with the advent of the ADAT (Alesis Digital Audio Tape) Multi-Channel Digital Tape Recorder. Prior to the Alesis ADAT recording unit, a digital multitrack recorder was costly (approximately \$50,000 Cdn.) while the Alesis was available for a modest \$4,000 (Mongeon 2005). The innovation of the ADAT machine allowed almost “every home and project studio to afford digital recording. This new technology allowed any artist or musician to record studio quality

⁵³I first experimented with home recording in 1994. I used mostly live equipment (equipment that was used for live shows), including a 24-track Peavey console, and Marshall amplification. This was connected to a computer with the recording program Sound Audio Workshop (SAW). Even though this was an early form of digital home recording, I thought that it was great because I was able to do all the mixing and adjustments on a computer screen rather than on an old analogue console. Initially, the sound quality was not great, but it served its purpose.

recordings” (Alesis 2005). The ADAT machine had the ability to record eight tracks of digital audio in a sixteen-bit format on an S-VHS tape (Super VHS tape), enabling forty minutes of precise digital recording. The Alesis ADAT unit was modular; therefore, “it became possible to add more units over time as budget and recording needs allowed” (Rudolph & Leonard 2001, 33).

The internal components of the ADAT machine are similar to those found in a VHS machine. A drum head within the ADAT machine “rotates at 3000 revolutions per minute. The four read and write heads are positioned at equal distances around the head” (Rudolph & Leonard 2001, 34). The recorder then creates a set of strips called heliscans. This is a process whereby a single head records each scan as it contacts the tape. In order to make a VHS functional in the ADAT medium, the tape must be formatted by using an analogue track containing a time code. This is achieved by recording the entire length of the tape in format mode. During the recording process, the ADAT machine adjusts the time code internally by lining up the linear and rotary tape spikes.

DIGITAL TECHNOLOGY IN THE HOME STUDIO

New technologies including ADAT and DAT enabled the home studio engineer to record in digital without the use of a production studio.⁵⁴ Musicians were able to use equipment intended for live settings within the home studio sparing the cost of specialized studio

⁵⁴By the early ‘90s, home recording enthusiasts were able to convert analogue recordings into a digitally editable product, yet home recording and digital technology were relatively new and did not produce a warm tone. Early digital recording was frail due to primitive processors and basic computer software.

equipment. Recording equipment, including the Alesis ADAT tape, converted an analogue track into an easily editable digital format.⁵⁵ Prior to the use of digital technology, the home studio operator was forced to edit music by using the cut and splice method as explained in Chapter 1.⁵⁶ Computer software made digital editing quick and precise without the complications and blemishes created by magnetic tape.

In the early 1990s, Macintosh computers produced a revolutionary recording program entitled RADAR. This program recorded an analogue signal and converted it into a digital format, rendering it editable. The final recording was then sent back and recorded on an analogue medium. This proved to be an effective method of home recording, but it still had its limitations. Home computers, both Macintosh and PC, did not have the ability to record and store an abundance of material (see Appendix A, Illustration #21). Still, in terms of recording storage space, Macintosh held an advantage until the mid-1990s when superior software, such as Cubase and Sound Forge, became available on PC.

Computer technology quickly developed, yet it was not until the market crash of 2000

⁵⁵From my experience, I can say that virtually every computer designed for sound recording is able to convert an analogue signal into a digitally editable file. Although on-board (inside the computer) converters are available for as little as forty dollars, off-board converters provide a smoother transfer of audio signals without the frailty that is often produced by digital technologies.

⁵⁶Home recording has been criticized for sounding frail because of its almost exclusive use of digital technology. According to Milstead, “there was a time when digital recording wasn’t up to the accuracy of analogue tape recording, but things have changed. Processors have gotten much faster - and cheaper - and dozens of professional-quality sound cards... are on the market today” (Milstead 2003). Today, digital recording is accurate and has an increasingly warmer tone.

that computers became affordable for the home studio owner. The average musician was able to purchase a computer that had the ability to record using high fidelity software for approximately \$2000. This was a definite bargain when compared to the prices in 1997, which ranged from \$10,000 to \$12,000 (Mongeon 2005).

The accessibility and viability of computers provided affordable home recording equipment which led to the abandonment of such mediums as ADAT. Software, including plug-ins (devices for additional effects and editing) became affordable for the average consumer, rather than being reserved strictly for production studios. The home recording engineer now had the option of using all digital means of recording or ADAT tape.

In response to the digitization of the recording world, Alesis made a plug-in card, known as the ADAT PCR card, that allowed ADAT recorders to work with computers. This card was an eight-track ADAT transfer hardware device, allowing files to be transferred directly to a computer for editing and mixing.

THE HOME STUDIO AND THE MUSICIAN

The advent of the home studio (see Appendix A, Illustration #21) enabled the average Canadian musician to record without the support of a major record label.⁵⁷ Home recording allowed rock groups to produce products that surpassed the recording quality of production

⁵⁷Prior to the advent of the project studio, few Canadian independent artists existed. The home recording studio and computer technology have encouraged aspiring musicians to produce and package albums from home. Canadian artists are now able to track, mix, master and produce artwork without the funding of a major label.

studios of the 1960s and 1970s. At the turn of the 21st century, the home studio became fully functional for the aspiring musician at a reasonable cost. With technological advancements, including home digital recording and access to the Internet, the independent musician began to flourish. Independent musicians were able to record an adequate demo from home without time constraints and corporate manipulation. Musicians were able to record demos, promote themselves on the Internet, and print and distribute their music to large labels. This independent process eliminated the need for preliminary “corporate infiltration,” or the acceptance of a label’s ideology; although, if an aspiring musician wanted to sell a lot of albums and tour internationally, financial support from a major label was required.

The home studio included a computer with recording software, a mixing console, and live equipment which consisted of amplifiers, microphones and effects. Although live equipment may not produce the same high fidelity sonic outcome as the project or production studio, it was adequate for the intentions and purposes at hand.⁵⁸

The home studio and its recording methodology has created a shift in modern compositional practices. Modern conventions enable musicians to experiment with various timbral and textual preferences which constitute the compositional process versus capturing the outcome of prescribed and predetermined performance idioms. Unlike the 1970s, when only superstar-status groups were able to experiment inside production studios, home recording

⁵⁸Generally, musicians who record in a home studio use equipment that they own and use for live performance. Grenville explains his use of studio equipment: “Back in Timmins we would record using any gear we could find. We would basically just use anything that we already owned for live performance. Sometimes, for recording vocals we would rent or borrow a better quality and more sensitive studio microphone” (Grenville 2006).

musicians now had the luxury of working without rigid time restrictions. Queen, for example, was able to compose and experiment at *Super Bear Studios* in Nice, France, for months at a time, allowing them to construct elaborate choir-like harmonies and a symphony of guitars (Jackson 1996, 105). Home recording has enabled professional Canadian groups such as Nickelback to compose and document original ideas prior to recording in a professional studio. Similarly, the amateur musician is now able to use and experiment with the various layers and capabilities of multitracking, enabling a hybrid form of composition.

THE FUTURE OF RECORDING

Home recording has enabled both amateur and professional musicians to record and document demos and rehearsals without major financial investment. The shift in digital technology revolutionized recording in the home and professional studio. Although home recording has simplified the recording process for the amateur musician, the home studio operator must contend with the constant evolution in technology. In order to produce higher fidelity products, the operator must regularly upgrade recording equipment, including the home computer, console, effects, software and amplifiers. Consequently, in an effort to maintain contemporaneity, the home studio may become a costly investment. As mentioned above, the quality of equipment used in the home studio cannot compare to that of the production studio. If an aspiring musician were to sign with a major label, it is unlikely that the demo they may have recorded in their home studio would be used as a marketable recording. Rather, the product would be re-recorded in a production studio.

There will always be a need for production studios in Canada due to the high expense of modern technology. In most cases, the home studio enthusiast does not have the financial resources to create a product comparable to one made in a production studio. As subdivisions of large corporations, production studios are able to constantly experiment and upgrade equipment as technology becomes available. Furthermore, production studios are equipped with highly trained personnel capable of operating studio equipment with precision, while the home studio engineer is generally trying to learn the basics of home recording by experimenting with various recording techniques.

Regardless of the technological advancements made by computers, software, and digital technology, there will always be a need for home recording. The home recording process began with a tape deck and microphone and evolved into a highly sophisticated digital procedure. Because of technological advancements, Canadian musicians in isolated regions are able to record and distribute their products from home. Computer recording software and graphic software such as Adobe Photoshop have enabled musicians to package and promote recorded goods in order to profit from album sales and promote themselves to label executives. Although it is doubtful that home recording studios will ever be able to produce products that equal or surpass those created by production studios, home recording will always remain useful to the amateur, professional and recreational musician.

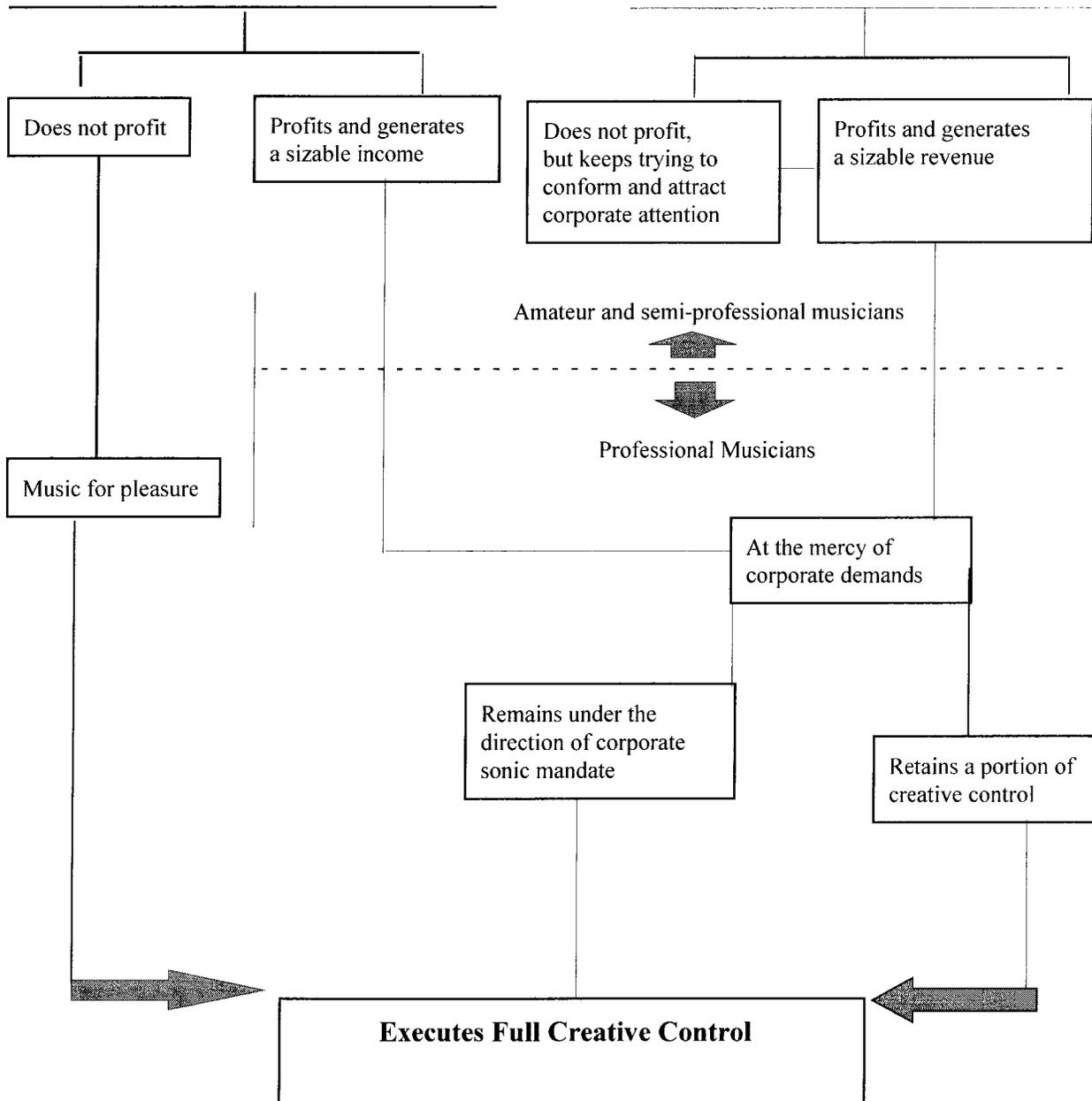
Although the Canadian project studio and home recording have similar characteristics, they greatly differ in terms of recording quality and physical structure. The project studio generally consists of a live recording room and a control room. The two isolated rooms ensure

that sound is contained within a specific space, producing a controlled atmosphere. Home recording on the other hand generally consists of one room that serves as both the control room and the recording room. The project studio has much higher fidelity equipment and commonly uses an amalgamation of digital and analogue technologies, while home recording focuses on computer and digital technologies. The project studio mimics the production studio in terms of sound deadening and insulation, while the home recording enthusiast generally does not use any form of audio insulation. Therefore, the project studio and home recording studios are quite different and it is unlikely that home recording will replace the project studio.

The following chapter documents a musician's quest for success within the Canadian music industry. This chapter is largely based on a model that I have created which illustrates the various paths that a musician may take while being an active member of the Canadian recording scene. The model is divided into two sections, creative ownership and corporate manipulation. Although it is difficult to categorize all Canadian recording artists, most Canadian groups and musicians can be placed within this model. Chapter Four will also analyze the advantages and disadvantages of signing with independent or high profile record labels.

Fig. 1
Creativity, Process and Production
MUSICAL CREATION

Creative Authorship ← → Corporate Manipulation
Spectrum



Chapter 4

CREATIVITY, PROCESS, AND PRODUCTION

Canadian recording venues for audio production, as listed above, comprise the project studio, the production studio and the home studio. These three creative spaces dominate the Canadian rock recording industry. Once an artist has a marketable product, what does he or she do then? Gaining international success within the field of Canadian music is difficult to say the least. This chapter will outline the various paths that musicians may take while working within the recording industry.

CREATIVE AUTHORSHIP: THE NON-PROFITING ROCK MUSICIAN

As illustrated in Fig.1 (see previous page) varying options exist for aspiring rock musicians. In some cases, musicians are controlled by corporate powers, whereby individuality is often suppressed, while in other cases, musicians retain creative authorship but without the promise of financial gain that major labels offer.

Generally, the non-profit musician does not record in a production studio due to high costs. Instead, this type of musician utilizes project studios as a location to practice, record and socialize. For example, for the past two decades, Rick Savard (see Appendix A, Illustration #22) from Timmins, Ontario, has been hosting musical gatherings (jam sessions) which have evolved into weekly recording sessions. Savard has a project studio located in the basement of his home, where rehearsals are recorded and documented using the live off the floor method of recording.

Savard's project studio has an abundance of new, used, rebuilt, and vintage equipment.

Analogue equipment is blended with digital technology to achieve a high fidelity tone. James Mongeon, a regular member of the Saturday night sessions, explains:

...we get a pretty good sound down there. Most people would be amazed with the sound quality from our live off the floor recordings. We usually record the session directly to tape, and then do the edits later. These edits are done by taking an analogue tape and sending it into Cubase [computer recording program] to do all of the edits. This works well because we use old school methods of analogue recording and fix them up a bit with digital technology (Mongeon 2005).

Savard's project studio is similar to many northern Ontario home studios where "a bunch of guys get together, bringing their own gear, coffee, smokes and poison of choice. We do this for pleasure, although we take it seriously" Mongeon says (2005). Savard's smoke-filled basement attracts both accomplished grey-haired musicians and aspiring students, both male and female, who desire to learn skills from these veterans.

The atmosphere differs within the project studio depending on whether or not it is a jam, rehearsal, or recording. Various musicians are welcomed into the project studio throughout the jam and song writing process. During jam nights, the drum kit is the focal point of the room and is set up near the back wall. The musicians then form a semi-circle around the drummer. This facilitates communication among the musicians, enabling the use of both visual and audio cues. The setup remains the same for rehearsal nights, except that the access to the studio is restricted to those musicians directly involved in the compositional and recording process. A centralized focus is required by musicians on rehearsal nights in order to prepare original compositions for recording.

Musicians do not present finished compositions to fellow band mates at the project studio, but rather use a blues method of composition involving intense improvisation. Ideas presented in original compositions are generally played for a length of time, until musicians are comfortable with the structural elements and chord progressions. When the musicians are comfortable with the song arrangement, two microphones are placed in the room and connected to a tape deck. This is a simple form of recording, which is used in many home studios and which serves as a memory tool.⁵⁹ Over several years of rehearsals, the musicians have employed recording as a means of archiving their music. Following the completion of ten to fifteen compositions, each of the musicians is given tapes and asked to brush up on his parts in preparation for formalized recording. Mongeon asserts the importance of this preliminary process by stating: “Without the use of scratch recordings songs would never get recorded. Our memories are bad, and sometimes great ideas only happen once” (Mongeon 2005).⁶⁰ Immediately following the relearning and rehearsal process, the group begins to systematically record.

Prior to recording, several physical alterations to the live room are needed to facilitate the process. Sound baffles and segregation boxes are placed throughout the room to keep ambient noises from bleeding into the microphones. Live off the floor recording at Savard’s studio requires little setup because vocal microphones, amps, and the drum kit are already in place.

⁵⁹Although Savard’s studio is a project studio, it is used like a home studio. Members of his *Saturday night jams* use his project studio for documentation and to remember rehearsed material.

⁶⁰Mongeon’s quote, stating that virtually every rehearsal is recorded, solidifies the importance of the project studio. Documenting rehearsals can only be done in project and home recording studios because of the high hourly rates in production studios.

This permits additional microphones to be set up with ease. To eliminate unwanted noise and to enable proper sound projection, unused amplifiers and equipment are removed from the project studio. Baffles are placed around the drum kit and amplifiers to obviate microphone bleeding. The vocalist is positioned behind a glass window outside the live room to guarantee that ambient noise is reduced on the vocal track. Mongeon explains:

As you can tell we work very hard to limit bleed. Once the amps and instruments are in place, the snakes are added to the mixture. Everything gets a microphone stuffed in front or behind it. Then the consoles, recorders and racks are set up in the control room. All of the recording is mobile equipment amassed by Sound Wise Productions and installed for a brief period of time. Once the setup is done, everything is tested, like it would be in a full-blown studio that is preparing to open. Tracking then begins. Like I said earlier, most of the tracking is live off the floor, but we often over-dub some of the vocals and guitar solos (Mongeon 2005).

Following the recording process, Vcomm and Soundwise Studios, from Timmins, consolidate equipment to edit, mix and master the analogue tracks. The tracks recorded at Savard's studio are captured using analogue equipment. These need to be transferred into digital wave formats to facilitate the editing process. The live off the floor method of recording used in Savard's project studio is not faultless, and a small degree of microphone bleeding is inevitable. Mongeon suggests that "microphone bleed can be a great thing. Some nights we just get the groove going and it is what gives our genre of music its feel. The only downfall from the noise bleed is the editing process... it can be very long and tedious. We try to make it work for us and

capture that live feel” (Mongeon 2005).⁶¹ Following the editing phase, the final product is sent to a mastering house. At this point, Mongeon begins the art work for the printing of the CD insert by using a high-powered computer equipped with Adobe Photoshop.

COMMUNITY BENEFIT SHOWS

Savard’s project studio not only serves as a social outlet for non-profiting musicians in Timmins, but also prompts the organization of benefit concerts. Once musical material is composed and recorded, the various bands that make up the Savard jams are eager to perform their original compositions in front of an audience. Musicians at this level are not concerned with making a profit from live events, but rather with aiding the community. Greg Vintar, an active member in the Savard jams, and also the head organizer of many benefit shows in the Timmins area, explains:

...we like to do something good for the community while showcasing new music... Poor people are starving and barely making it through our cold winters. Through music we are able to show people the good within the community, and we are very successful pulling-in money and donating 100% of it to the Timmins Food Bank. We like to keep the money in the community and give everything to a local group that we know needs the money. Although we believe in donating money for great causes such as hurricane relief funds, our number one priority is to ensure Timmins’ survival. This town has a long history of promoting charity events such as the Food Band Drive; thus many bands are willing to be part of the show, not only to aid the community but also for local publicity (Vintar 2005).

⁶¹Project studio recordings are not flawless because of background noise and microphone bleeding. For the rock/blues genre background noise may be beneficial; Vintar explains: “A little while ago I was recording Dax [Chenier]; we were doing a guitar and vocal piece in my kitchen. I used my kitchen because with Dax’s powerful voice, I got a nice natural reverb. The whole time we were recording, my dog was outside and kept barking. At the time, we thought that the dog was ruining every take. Well after a while we just decided to sit back and listen to some of the takes... we loved it. The dog’s barking was kind of hard to hear but added a real ‘liveness’ to the recording. It sounded a lot like southern blues” (Vintar 2005).

Every year, Vintar's group composes a song that is lyrically dedicated to a specific cause. In many respects, benefit shows serve as a vehicle to promote Vintar's band. For a month prior to an event "our music is played non-stop on the radio. We love that because it is nice to hear that all of our hard work paid off" (Vintar 2005). The charity events generally occur in a Timmins bar named The G.V. People line the streets of Sixth Avenue in minus thirty-degree weather with a non-perishable can of food and a five-dollar bill in hand on concert night. By nine o'clock a smokey haze adds to the character of the room amplifying the 24-can (twenty-four light) multi-colour light show. James Mongeon, and Shawn Fournier are not only in charge of sound and lights, but are also recording the event live.⁶² Mongeon uses the master out busses, as explained in Chapter 2, and sends the live output directly to DAT tape to convert the live analogue tracks into individual digital tracks. These tracks are then brought home and sent into his home computer where further editing is conducted.

Such non-profit musicians are not hampered by corporate powers influencing their genre of music. It can be argued that non-profit musicians are in an ideal position, due to their freedom of choice and lack of pressure to produce commodified music. The non-profit musician plays music primarily for personal pleasure.⁶³

THE PROFIT-GENERATING ROCK MUSICIAN

⁶²Mongeon and Fournier record almost every benefit show. Not only do they capture the performances on audio, but also on video. Mongeon and Fournier are able to place the professional quality audio DAT recordings on top of the live video footage.

⁶³Although these Timmins musicians are very serious about music, they play music as a form of pleasure and creativity only. These individuals do not plan on becoming signed to a major label.

The profiting musician shares many beliefs with his non-profit counterpart when it comes to the importance of creative independence. While earning a living from performance and CD sales this musician does not play music strictly for financial gain, but rather, enjoys and believes in the creativity of his or her style and compositions. Creative control is still retained by such musicians, who are rarely influenced by corporate powers and the mass media.⁶⁴ These performers are often independent and have little promotion. While recording, these musicians hold creative control and thus can make sonic demands on producers and engineers. Studio personnel, in many instances, are hired by the musicians. Depending on their financial stability, the profiting creative artist will generally record in the upper echelon of project studios or in smaller production studios.

These musicians customarily raise money to record by playing live shows in competitions, concert halls, clubs, and as opening acts for established groups. Events known as a “battle of the bands,” or a “Band Slam,” promise cash prizes and recording time in a production studio. Musicians who write their own songs have excellent odds at winning the battle of the bands competitions because judges are always looking for creative musicians who demonstrate talent and innovation without mimicking already successful bands. Therefore, groups that display originality are generally successful. The touring bar circuit is an important avenue that many musicians travel to hone their skills and develop an audience while raising funds for recording a demo or album. While managers are beneficial for artists at any level, amateur musicians

⁶⁴Groups such as Hamilton’s Threat Signal and Timmins’ Weasel Bone may be categorized as independent profit generating artists. (See fig. 1). These groups record and tour, but have not yet signed with a major label or gained national recognition.

generally can not afford professional management.⁶⁵ In such cases business matters are handled by the musicians themselves.

Even established musicians have to choose whether or not to record in a project studio or a production studio. The project studio provides a relaxed and informal setting, while the production studio is marked by rigidity and is carefully monitored by studio personnel. If the musician anticipates recording in the production studio, ground rules must be established in order for the musician to retain creative control.⁶⁶ Studio personnel in production studios frequently strive to take creative control from musicians, while project studio personnel are generally more collaborative, helping an artist to realize his or her unique vision of an album, rather than producing a commercialized product. Following the choice of studio, the actual recording process can begin.

The completion of a new album is generally marked by a CD release party in a bar or concert hall. These parties serve as a vehicle for promotion, and raise public awareness of the individual or band. The artist generally performs live to obtain further recording funds. Once this process is complete the cycle often restarts. Many Canadian artists such as Jeff Healey,

⁶⁵By 'amateur', I mean musicians that are not at the professional level. Amateur musicians may tour and perform in concert settings, but do not tour on as large of a scale of professional musicians. Also, professionals are generally signed to a major record label, while amateurs seek recording contracts.

⁶⁶Recording in a production studio requires skill and accuracy. Huber and Runstein explain that "the expense incurred in using a professional studio requires that you be practiced and ready to roll on a specific date or range of days" (Huber & Runstein 1997, 14). If musicians cannot play flawless takes, the expense of recording in a professional studio dramatically increases.

Honeymoon Suite, Trooper and Blue Rodeo earn a large percentage of their income from CD (or album) sales and live performance. CDs are sold at live events and marketed in record stores and other commercial establishments. Today, artists also use the Internet as a marketing tool, selling CDs through their own web pages.⁶⁷ Nevertheless, touring is the most important source of income for the profiting performer. The practice of touring draws attention to a band, attracting more fans, and sometimes catching the ear of independent and major record labels looking for up and coming acts.

Profiting bands from Canada generally tour for an average of four months a year. This method of touring changes at the professional level, when touring becomes possible year round due to high demand and promotion. Tours conducted by musicians at the amateur level are played throughout the summer time, taking advantage of good Canadian road conditions and frequent outdoor festivals. Different levels of touring are attainable for creative musicians depending on their level of success. The nature of touring varies in proportion to the band's stature, which may be local, regional, provincial, national or international. Performing at the local level involves little planning, and management is not required. As groups become more established they embark on larger scale tours. National tours, for example, require a great deal of planning which is often executed by agencies or management groups.

An experienced agent has contacts across the country and is able to book shows according

⁶⁷The Internet, for many bands, serves as an ideal promotional tool. "A website gives fans up-to-date information on shows, directions to shows, album releases, interviews... A website gives you world wide recognition... For several decades, only large artists could reach international audiences" (Belleville 2004, 106). Nowadays, anyone with access to a computer can look up a band and hear a recorded product.

to approximate travel time and geographic location, thus lowering expenses for the band.

Traveling across Canada is time-consuming and costly due to fuel consumption and the cost of food. A proper vehicle such as a cube van or R.V. (recreational vehicle) is often required to furnish musicians with a tolerable ride.⁶⁸ After expenses for food and fuel, there is often little, if any profit remaining. Jonathan Heard (see Appendix A, Illustration #23), a sound tech and tour manager for Promane, explains his journey across Canada in 2004:

Traveling across the country was long to say the least. Some of us traveled to Timmins from Ottawa to pick up the cube van and to get on the Trans Canada highway. From there our first show was in Fort Francis, near Thunder Bay, so that meant a 14-hour drive. On the way we started having problems with the van over-heating, which caused further delays. When we arrived we had to setup all of our gear and that was not a small task. We normally travel with full production, including a big P.A. (public-address) system and a 24 can light show, but for this tour we left it behind to save time and money. In this case the bar was responsible to pay for all production costs, but the problem was that it was more of a pain in the ass than anything. When you use different gear for every show, there always seems to be a problem patching into the system. This was tough for me because I was doing sound on a different console and using a different lighting board every night.

When we arrived in Fort Francis we played shows there for three nights and then took another few days to drive to Saskatoon. Most of our drives were done at night right after take down, which usually meant 4:00 a.m. We played Saskatoon and La Ronge and then went to British Columbia for a week. Following B.C. we went way up north to Whitehorse [Yukon]. To wrap up the tour we had a Molson Canadian Rocks show in Timmins four days after our last night in the Yukon, so we drove from Whitehorse to Timmins in one shot. We took turns driving between me and the guys in the band, and three days later we got there in time to set up and play our next show... As you can see, doing this amount of traveling in a huge cube van would be expensive. In the north diesel was over a dollar a litre over a year ago... We did make some money, but only because we charged a lot per show; but it was the fuel cost that killed us. Thank God that we had a good response to our CD and profited off of that (Heard 2005).

Touring may not always raise a lot of money; yet if expenses are kept minimal and the band is able to earn money from album sales, a profit is feasible. Bands are often driven toward

⁶⁸Musicians may choose to save additional costs by sleeping in their vehicle, however, venues generally supply lodging.

commercialization because they feel there is not enough work for artists playing original material. Cover bands - bands who perform musical material that is composed by another group - may profit more than original artists at the amateur level, yet the cover artist will not have the opportunity to become signed to a major label, due to their lack of originality. At the semi-professional level, A&R (artist and repertoire) scouts seek groups that do not necessarily conform to those heard in the mass media, yet who play original material that labels may want to commodify.⁶⁹

The semi-professional profiting musicians are in a desirable position because they are able to profit from playing and composing music without being controlled by corporate powers. The problem with being at this level of the recording industry, is that although musicians are profiting, they are not always making enough to survive, thus members often seek other means of income. The profiting musician may remain at this level (as displayed in Fig. 1) and never develop a commodified image. On the other hand, the profiting musician may have the opportunity to sign to a major label and become commercialized. This step may be risky, since groups are often forced to comply with the demands of higher levels of studio and corporate powers, resulting in a loss of creative control.⁷⁰ Artists such as Elvis Presley, Nirvana and the Beatles were all successful musicians who maintained their uniqueness and made great financial

⁶⁹When a rock group creates a new genre of music they often become successful because labels look for new genres of music that they can commodify. Rage Against the Machine, for example, is a group who became successful and commercialized a blended genre of rap and heavy metal (Bogdanov 2003).

⁷⁰High powered record label executives may entice individuals to comply with their demands, yet signing to a large record label has many benefits. Musicians that are part of a major label “family” have the opportunity to play in large venues, gain national or international recognition and make a lot of money.

gains within the business. On occasion, groups are able to create new genres of music without losing creative control. This is considered rare in the music business, and by and large, most groups lose some of their individuality as they become artists under corporate mandates. If the artist were to lose creative control he would be categorized under fig. 1 as being at the *mercy of corporate demands*.

CORPORATE MANIPULATION AND THE NON-PROFITING MUSICIAN

The non-profitting musician is generally seeking the attention of corporate powers in an attempt to become signed by a major label. As described earlier, although a band will perform live shows for money, they will often not profit financially from the performances, in most instances barely breaking even. These groups desire to gain entry into the mainstream, not by creating a new genre of music and not through originality, but by replicating an already established genre and image portrayed by the mass media. Such conforming performers will not likely become signed by a major label, nor will they earn money comparable to a group at the professional level. These people go out of their way to sound “top 40s” in the vain hope of attracting A&R scouts. By conforming to the image and sound *of the day*, it may be argued that many of these bands sacrifice musical integrity for capital gain. Many Canadian rock groups fall into this category. In their albums, *My Own Prison*, 1997, and *Human Clay*, 1999, the American group, Creed, offered a distinctiveness in sound, particularly in the vocal timbral quality, paving the way for other aspiring musical acts. Soon after, however, several Canadian bands, including Vancouver’s Default, duplicated their sound and obtained recording contracts. The recording industry soon became saturated with Creed-sounding clones. Some of these groups simply faded away, while others, including Default, remained prominent Canadian rockers.

The Ottawa-based group, Turning Into Salt, exemplifies notions of corporate conforming non-profit musicians. Turning Into Salt have played numerous local shows and often play for benefit events, in the end generating little or no monetary income. Having a commercial sound, Turning Into Salt resembles groups such as The Killers and Cold Play. Turning Into Salt's music uses dance beats with a strong emphasis on the piano. The band has recently recorded a six-song demo CD at Addictive Sound in Ottawa.

After several months of rehearsal and live performance, Turning Into Salt felt that it was time to record a demo to promote themselves and to attempt to target the mainstream market. The band's initial goal was to record in a production studio, but the high costs did not permit them to do so. By recording in a small project studio Turning Into Salt were able to record a six song demo for only \$1,000. Although recording was achieved at a modest price, production of the CD and accompanying packaging also needed to be taken into account. Costs were determined by the quantity of the CDs manufactured and the size and colour printing requirements of the jewel case booklet. Large orders consisting of a thousand discs or more are cheaper per unit due to a bulk discount. Turning Into Salt used a two color scheme printing five hundred discs resulting in a cost of \$1,400. Therefore, for them, \$2,400 was required to make a demo CD in a project studio. Before beginning, funds were raised through shows and personal contributions. A \$1,000 contribution came from the band, with the remaining \$1,400 fronted by a member's father. Once the appropriate funds were in place, the band chose to record at Addictive Sound Studios in Kanata, Ontario, based on the studio's respectable reputation.

The studio's producer/engineer is Dean Hadjichristou, a graduate in recording technology

at Fanshawe College, London, Ontario. Hadjichristou's studio epitomizes the project studio. It is located in his parents' basement, which was modified by having a studio constructed in the main room and a control room built within an existing bedroom.⁷¹ The studio uses the digital computer recording program Pro Tools LE 5.3.1, which records 32 tracks at 24 bits and 48KHz, enabling multitrack recording and digital editing. Hadjichristou's microphones include the Rode NTK condenser tube microphone, Audio Technica, Shure and various others. The project studio has guitar amplifiers, an electric and acoustic drum kit, and bass amplification, all of which are available to recording musicians. The engineer encourages musicians to bring in their own equipment if they feel it is important to capture a sound unique to their group. Dean Grenville, (see Appendix A, Illustration #24) Turning Into Salt's bass player, explains the studio experience:

This was a great opportunity for us, seeing as we had never recorded anything before. When I joined this band, I knew that we all had the same goal, which was to record an album. It was nice to be working with a band that played original compositions rather than performing strictly cover songs. It took us a little while to get the money together, but as soon as we did we quickly chose a studio and engineer that produced quality material and that fell under our price range.

We multitracked the entire session, which was a new concept to me. We first recorded the drums, then keyboards, bass, guitars and vocals. Drums always seem to take the longest. I think that this is because so many drummers are not used to playing to a click track and are always going off the beat. It was interesting to hear everything come together; it was like a puzzle. I recorded the bass tracks using a Hartke head and an Ampeg bass cabinet that had eight ten inch speakers. The whole recording process from start to finish only took us three days. The engineer did one full day of mixing and mastering (Grenville 2005).

Drummer, Caleb Abbott, (see Appendix A, Illustration #25) was enthusiastic about Turning Into

⁷¹As explained throughout Chapter 2, project studios, whether from the 1970s, or now, are by and large made up of scrounged materials and used equipment. Although Hadjichristou's studio is located in a home, it is considered a project studio because of the quality of equipment in the studio and because there is a control room isolated from the recording room.

Salt finally entering a project studio. He explains:

The recording experience was great. It felt good to finally be sitting there getting everything done, watching it all get done, trying to blast through your parts to save money, listening to click tracks and running back and forth into the studio to hear if it sounded good, all the while your band sat on a couch watching you get it done. It was really neat, there were frustrating moments and sometimes a clash of direction, but all in all it went very well. The whole experience went by quickly; after all, it was only a total of 32 hrs. It was a rewarding experience and for myself, doing the recording was like making a commitment to myself, the band, and the future of the band. I see a recording as the midway point for a band, not in their success, because the album could flop, but in the direction of the band. Getting the recording done is the first major battle; once you hit that point it gives you inspiration to keep going because you know you can (Abbott 2005).

On September 17, 2005, Turning Into Salt performed at a CD release party at Zaphod's in Ottawa to promote their self-titled demo release. The band sold a number of copies and raised further money by charging a five-dollar admission at the door.⁷² The proceeds from this event were put toward "the money that we still owed for the printing. The band is not in the clear yet, but the CD release paid for a lot of the printing expense" (Grenville 2005). Turning Into Salt has been inviting A&R reps to their shows in an attempt to attract corporate attention with the goal of becoming signed to a major record label. At this stage in their career, the band may progress, become well-established, and sign a recording contract with a major label. Turning Into Salt aspires to record a full length album at a local project studio in the next year. The band believes that a full length album will enable corporate labels to "hear a greater range and diversity in compositions" (Grenville 2005), thus leading towards a recording contract.

⁷²At their CD release party Turning Into Salt performed a 45-minute set of all original music. Their demo recording consisted of six compositions, yet live they perform up to twenty compositions.

CORPORATE MANIPULATION AND THE PROFITING MUSICIAN

Like the non-profitting musician who chooses to conform to the musical tastes promoted by the mass media, the corporate-compliant profiting musician seeks a recording contract with a major label. Unlike the non-profitting artist, he or she already profits from CD sales and live performance but wants more. Artists involved at this level of recording and performance may sacrifice musical integrity to produce a commodified product with the hopes of achieving a lucrative recording contract. Tours are required to promote new albums which, in the end, are expected to generate more income. The exact nature of the tour varies greatly, depending on the success of the band and their affiliated agencies. Both management and agents are major players with the band, taking care of bookings, sales and appearances.⁷³ In exploring this aspect of the business, my personal recording experience shared with fellow band mates, will provide insight into the life of a corporate-abiding musician.

Over the past four years, I have been the lead guitarist in Promane (see Appendix A, Illustration #26). During this period, the band has undergone many changes in personnel, leaving my brother, Barry (see Appendix A, Illustration #27) and I as the sole founding members still in the group. Both Barry and I began touring at the age of twelve with drummer Joel Helin, so when we formed Promane touring was not a new experience for us. From 2000 to 2004, *Stone's Throw* - which later became Promane - (see Appendix A, Illustration #28) toured throughout the

⁷³Stim explains the importance of understanding music law and management in his *Music Law: How to Run Your Band's Business*. Throughout this work Stim explains that “there are innumerable ways that managers have screwed bands” (Stim 2004). Some common mistakes are, having no written agreement, having an agreement that lasts too long, and having a manager’s commission calculated from too much income (Stim 2004). These are important elements that musicians need to address with management in order to succeed in the music industry without losing money.

summer months all over Ontario and Quebec to raise funds to record an album. In 2002 the band began devoting 100% of its profits towards recording, but by 2003 the band experienced difficult changes, with members departing or being dismissed. Some members left the band due to personal commitments, while others were let go due to poor performance and habits that negatively affected their performance. The band raised \$10,000 and put it toward recording, mixing, and manufacturing the album. The outcome was the 2004 release of the album *Stages* (see Appendix A, Illustration #29), recorded at Pebble Studios, a production studio in Ottawa.

Owner/producer/engineer Peter Gilroy of Pebble Studios initially led our recording project before passing us off to a brilliant young engineer, Andy Zeitz. I recall my initial amazement at their equipment and professionalism upon walking into this production studio for the first time. We were all proud of ourselves and felt that all of those sleepless nights in smoky bars had finally paid off. The studio consisted of a control room, main room, and several isolation rooms. As discussed in Chapter 2, production studios spared no expenses regarding equipment, insulation, and fabrication. We began the recording process with our drummer at that time, Paul Duchesne, by adjusting and setting up the studio drum kit. The engineer spent the entire first day tuning and experimenting with various microphone techniques on the drum kit to ensure that each piece of the drum kit would be properly tracked. Over the next two days, the drums were recorded. This was immediately succeeded by Barry recording the bass tracks. I began to lay down the guitar tracks in the main room with my mentor and guitar professor Stephen Rollins keeping a close eye on me and the recording process itself (see Appendix A, Illustration #30). For some reason, I was unable to play the rhythm tracks on time. Personally, I knew that I was playing on the beat, yet my tracks were being recorded slightly behind the beat.

After many takes without improvement, I decided to try recording in the control room. The problem was solved instantly. For some reason, either the drum and bass tracks played into my head phones were delayed, or my guitar was being recorded with a slight signal delay to the console.

We recorded in several block sessions booking five days in a row at the studio, followed by a short tour before going back into the studio for another five-day period. Once the recording sessions were under way we realized that our producer wanted us to take a mainstream approach to the compositional process, rather than attempting to be innovative. Although we did have final say over our recorded product, we were persuaded to adopt the producer's ideas in the hopes of gaining radio airplay.⁷⁴ This created some tension within the band, which exacerbated already existing problems. As a result, we were forced to dismiss another band mate, causing Barry and I to acquire financial security for the band if we hoped to complete the project. Our producer suggested that we change the group's name from Stone's Throw to Promane. He also suggested that Barry and I take immediate action and copyright our compositions before other band mates could do so. Not long after, Barry and I formed and incorporated a company, Promane Holdings Incorporated which acted as our safety net. According to Zeitz, we had to keep business and friendships separate in order to succeed in the music business.

Further changes were made within the band due to the recommendations of studio

⁷⁴Taking a mainstream approach to rock compositions was largely my own fault. Although I have always wanted to be recognized as a talented rocker, I had a vision of being signed to a major label and was willing to do anything to make my dream come true. Looking back at the situation, I realize having a commercialized sound and relying on the judgements of studio personnel was not in my best interest.

personnel. Our producer felt that our lead singer at the time was not doing a professional job and recommended that Barry, who was singing backup vocal tracks, replace him. As the former lead singer of several groups, Barry was enthusiastic about resuming his role as a lead vocalist. Barry explains the changes within the band:

At this point in the band's progression, I could see the divide that was pushing us towards having to make difficult decisions. Within the band's infrastructure, you not only share musical ambitions, but in many cases, share a profound friendship that develops. In our case, the band was getting to a level where members needed to exhibit reliability and professionalism in order to sustain the band's mission for obtaining success. Therefore the friendship that had once been the nucleus of the band was being put into question. *Promane* at this time was getting attention from touring agencies in Western Canada, while in Ontario, the band had embarked upon numerous touring engagements with Molson Canada. This was a pivotal time where the realities of running an organization outweighed any ties to sympathetic friendships. Survival in the business is rather difficult to secure; therefore we sought ingenious ways to generate income and gather a loyal following within diverse geographic regions. For the manifestation of these goals, we soon realized that we would need a product to market, promote and sell ourselves; thus it was not long thereafter that rigid composition and recording of what would become our debut album consumed the majority of our time. In retrospect it was a vital component in advancing our career (B. Promane 2005).

After another successful tour in smoke-filled bars across the province, Barry and I were ready to get into the studio and finish tracking the album. We both had degrees in music and were firm believers in maintaining creative control while demonstrating our talent through original material. We had a few new ideas that we mentioned to our producer to make our music more distinctive. Not only were our new ideas not approved by studio management, but to our surprise the editing process had already begun. In one of our pieces entitled *I'll Get By*, Barry had composed a contrapuntal guitar solo section much in the style of the 18th century counterpoint of J.S. Bach. We thought that it would be unique to have a Baroque- influenced section within a rock ballad, but to our surprise the engineer removed the entire section saying

that it was not commercially appealing. Such editing not only occurred in *I'll Get By*, but in segments of all of our compositions that displayed any kind of musical creativity. We were told that this was done, not because the engineers did not like the creativity, but because they did not think that it had commercial viability.

I was not satisfied with the final product due to the many transformations within the band and the influence that the studio exacted upon us.⁷⁵ Nevertheless, a thousand copies of the CD were made, costing us a total of \$14,000 which included recording, re-recording, mixing, mastering and printing. Barry was also displeased with the corporate controls placed on our creative expression:

No doubt it is a hard pill to swallow when you slave at writing songs and then have them torn apart by a producer. In our quest for obtaining radio play, we had to go on the word of the producer; that certain segments of our music had to be altered or dropped if we hoped to have the slightest chance at cracking into the mainstream music market. In hindsight, this sacrifice would only be viewed as the most tragic event in our musical existence. In what can be described as desperation to obtain admission into the closely patrolled music industry, we sacrificed a large portion of our musical integrity as we conformed to every demand of the producer. It was the 'watering-down' of our individuality as every ounce of personalized touch that characterized the music was stripped away. Disheartened to say the least, this experience served well in spotlighting the importance of maintaining musical integrity and ownership over sonic property. By viewing the *Stages* album as a learning experience, we have already made the decision to record, produce, and engineer our next album on our own. Perhaps an appropriate album title might be *Beyond the Water*. It will be vital to believe in our own creative voice and disregard the mainstream. It is fair to say that the 'Bohemian Rhapsody' [by Queen] type of song only emerges when one has the courage to take a chance, break down industry conventions, and fight corporate hegemonic powers. At the end of the day, whether it works out or not, I am certain that we will be proud of our work, because it will be our own, regardless of what people think (B. Promane 2005).

⁷⁵My recording experience may place high powered studio personnel and record executives in a poor light, but this is not always the case within Canadian rock music. Many groups are pleased with their record labels and management. I chose to share my personal experiences and the views of individuals from my band, not to generalize and put down all label executives, but rather to illustrate my personal experiences.

Following the completion of *Stages*, we decided to promote the album by embarking upon a national tour. In the summer of 2004, we were fortunate enough to be sponsored by Molson Canadian and headlined their *Rock Star* parties. Molson enabled us to play large scale V.I.P. events, which promoted our album and gave us the opportunity to travel and make money playing music. Likewise, Brown Sound, Kodiak Music, and Graffiti Productions booked the western leg of the tour.

Our days consisted of driving countless kilometers through the night, setting up equipment in the morning and afternoon, and performing practically every evening. Luckily, our agent was able to book our tour in a manner that kept travel minimal, although driving across Canada is a long haul no matter how you look at it. Our tour consisted of thirty-three shows in thirty-five days, stretching from Ottawa to Whitehorse. After packing up our equipment at *The Capital* in Whitehorse, the band got into our cube van and started driving towards Timmins, where a CD release party was set to take place in the largest concert venue in the city. We finally arrived in Timmins three days later; the entire trip was driven without a single break. We were fortunate to travel in a cube van that was partly an R.V. (See Appendix A, Illustration #31). Thus, we were able to sleep in beds, watch movies, and play cards to pass the time. On occasion, a last minute song writing or rehearsal session would take place en route.

We arrived in Timmins to an enthusiastic crowd asking about our touring and recording experiences. The day prior to the show, our techs were busy setting up the equipment for the event while Barry and I were interviewed by press and television reporters. People were

particularly interested in our encounter with Prime Minister Martin (see Appendix A, Illustration #32), with whom we had the honor of having breakfast in Watson Lake, Yukon. Barry reflects on the touring experience:

Most certainly the tour had its high and low points. Singing every night became exhausting. Before we even left, I realized that it would not be easy. Upon the commencement of the tour, my only concern was my voice. I knew that if I got sick or strained, I would let down the rest of the team. The last thing I wanted was to cancel shows because I could not get the job done - no pressure! That said, I went out of my way to make certain that my endurance was at its finest. I was experimenting every night on stage to find ways that enabled me to perform in total comfort. It was on this tour that I began using IEM's or In-Ear-Monitors. It was a struggle to find that perfect comfort zone: very little drinking, good eating, going to the gym daily, ensuring reliability with the stage equipment, and most importantly keeping in touch with my fiancée who I would not see for months.

Above and beyond the realities of the road, the part of the tour that I found most enjoyable was the social engagement. The people we met were fabulous in that they invited us to parties and their homes for dinner; we even made it to a local wedding in Watson Lake, Yukon. We also managed to attract the attention of various celebrities. Being a longtime fan of the Canadian aerobatic team 'the Snowbirds' it was a thrill to meet them and spend the night performing our music for them to a capacity crowd. Likewise, dining with the prime minister of Canada was another highlight of the trip. As gratifying as this tour was, in all honesty, when I struck the last note on my bass in Whitehorse, a feeling of relief, joy and sadness overcame me. Somehow we made it, and now, it was finally over (B. Promane 2005).

Although we were successful with our tour, our album did not sell as well as we had hoped. Our album seemed to be commercially pleasing, yet we did not have the promotion or management to make it successful. In many ways we felt a sense of relief because of the many problems that we experienced at such an early stage in our recording experience. We were pleased that we were able to keep our musical integrity and compose and perform music that was entirely our own creation. Clearly, many groups travel down a path that leads to corporate manipulation. Some say that it is part of the game, while I on the other hand believe that artists

should demand and retain creative control by displaying musicianship and uniqueness through composition.

AT THE MERCY OF CORPORATE DEMANDS

The four categories listed above and in Fig.1 identify the various creative processes in the production of recorded goods within the rock genre. Musicians are given a choice; they have the ability to remain independent with the freedom of musical choice, or they may choose a path that leads towards fame and financial gain, but also musical compromise. As explained above, the corporate abiding musician often suffers a loss of musical integrity due to the high levels of infiltration of corporate ideology. Although major record labels tend to control their clientele, being signed to a major label has several benefits. These artists are often well promoted for radio performance and live performances leading towards album sales. Major labels also give newly signed rock bands the opportunity to perform in large venues and open for successful international artists.

As illustrated in fig.1, musicians from both ends of the spectrum may fall under the influence of corporate powers. Musicians that are highly independent, on the creative authorship side of the model, may become successful musicians by performing and recording a genre and style of their choice and/or creation. Corporate infiltration generally does not occur with

independent musicians unless the artist signs with a major record label.⁷⁶ Contracts offered by record labels are often appealing, yet the musician frequently loses power over recording methods, stylistic characteristics of composition, self image, and overall control. Courtney Love from the band Hole explains how corporate control affects the musician's income:

This is my "funny" math based on some reality and I just want to qualify it by saying I'm positive its better math than what Edgar Bronfman Jr. [the president and CEO of Seagram, who also owns Polygram] would provide. What happens to that million dollars? They [the band] spend half a million to record their album. That leaves the band with \$500,000. They pay \$100,000 to their manager for 20 percent commission. They pay \$25,000 each to their lawyer and business manager. That leaves \$350,000 for the four band members to split. After \$170,000 in taxes, there's \$180,000 left. That comes out to \$45,000 per person (Love 2000, Digital Love).

There is a common misconception that musicians become rich by releasing one hit record. In reality, although musicians generally receive a large sum of money for a recording contract, as Love explains above, the musicians themselves receive only a modest portion of the negotiated sum.⁷⁷

⁷⁶Nickelback's Chad Kroeger, who is now an independent artist, has recently become the Canadian spokesperson for "the new *McDonald's Big Mac Meal Tracks* promotion" (Newton 2006). Rather than fighting with the big five record labels, Kroeger chose to encourage file sharing through the purchase of a McDonald's meal. Chart Attack, who is working in conjunction with Kroeger explains the problem with file sharing: "as record companies will readily inform you, the majority of illegal downloaders are young teens who, unless they're spoiled little brats who get their own car for their 16th birthday, have no access to a credit card to access most legal download sites" (Newton 2006). Therefore, these individuals do not have the money to rush out and purchase albums, so instead they pirate music.

⁷⁷Consumers often believe that Canadian rock musicians have an abundance of money. This is not always the case. Groups such as Trooper, April Wine and Honeymoon Suite all continue to release albums and tour in small bars and concert halls. Meanwhile the average consumer does not even realize that they still perform. From personal communications with Stuart MacArthur and Ken Schultz (professional sound techs) I have realized that these groups have not only poorly managed their money throughout their careers, but they also do not make nearly as much as one may think. These professional musicians struggle to pay their bills much like the average person.

RETAINING AND REGAINING CONTROL

For musicians in general, creative control signifies a degree of success and integrity. While corporate infiltration often denies a musician's sense of individuality, artists that are able to obtain a high level of success often regain a portion of creative control.⁷⁸ This generally does not occur unless the band or artist has reached a high degree of success over a long period of time. Bands that reach this level of success are able to experiment with new material and push the limits of their fan base. Although experimental music may drive away some listeners, these musicians have developed an image through the mass media and established a cult-like following, thus gaining new listeners and often keeping old listeners.

This level of success can be seen in the work of the group Queen. Led by front-man Freddie Mercury (see Appendix A, Illustration #33), over twenty years and dozens of hits, the group was able to maintain uniqueness. Queen was able to experiment and compose music that required a state-of-the-art production studio at all times. Due to the musical characteristics featured within their genre, including choir-like harmonies and contrapuntal guitar orchestration, the band needed a production facility that allowed them to experiment with this complex compositional process. Queen, along with bands such as the Rolling Stones and Pink Floyd were fully supported financially by their labels. Groups that do not reach super-star or auteur status are under strict contract and lack freedom. Once relinquished, it is rare for a Canadian group to

⁷⁸Nickelback for example, now owns their own label named 604 Records (licenced under Roadrunner Records). This label acts as both a production company and record label (604 Records 2006) Owning their own label gave Nickelback complete control over their compositions and management. Nickelback's Chad Kroeger has signed major Canadian artists to his label including Three Doors Down, Theory of a Deadman and Thornley (formerly from Big Wreck).

regain creative control due to the increasingly high level of corporate control. Shania Twain is a rare example of a Canadian artist that has regained creative control. Shania's situation is unique because she married Robert John "Mutt" Lange, quite possibly the most influential producer in the entire music industry. She is able to control business arrangements with her husband, while relying heavily upon his methods of recording and production.

Throughout this chapter the roles of both studio personnel and musicians have been discussed. As well, the pros and cons of corporate affiliation have been examined. Although it is possible for musicians to gain a fan base from recording independent albums, it is not very common to achieve commercial success without the backing of a major label.⁷⁹ The roles of the engineer and producer change, based on the professionalism of the studio (home studio, project studio and production studio) along with the degree of corporate infiltration experienced by the individual.

The next chapter will take an in depth look at Greg Vintar who is a musician, producer, and engineer from Timmins, Ontario. Vintar is able to understand the needs of musicians because of his personal experience within the field. Unlike Vintar, corporate engineers produce a commodified product that often lacks individuality. This lack of individuality causes the musician to become an object rather than a creative entity. Many critics believe that production studios operate on a similar principle to an assembly line; engineers and producers collaborate to

⁷⁹As noted throughout this thesis, several individuals have created their own labels because of their desire to become independent artists. Individuals including Bernie Finklestein (True North Records), Chad Kroeger (604 Records), and Myles Goodwyn (Civilian Records) have all created successful independent record labels. Being an independent Canadian artist has become easier largely because of modern technology.

create a standardized and marketable product.⁸⁰ Although there are many creative groups and individuals in the recording field, they are often overshadowed by a standardized practice of recording. Conversely, Vintar believes that musicians and engineers are equals in the studio environment. Being the owner of a successful project studio, Vintar is able to work with musicians on an individualized basis. This methodology enables him to personalize his service by experimenting with the musician. In doing so, particulars pertaining to equipment selection and timbral quality can be collaboratively achieved. Vintar's individualized service is furthered by dabbling with unconventional methods of recording, which deploy a range of specialized techniques to best suit the needs of the musician, including customized guitars and amplification. Although Vintar's studio is situated in his home, it should not be considered a home studio, but rather a project studio due to the abundance of high fidelity technology that comprises its composition. Because Vintar's studio is located in Timmins, Ontario, Vintar has brought recording to an isolated area, where recording previously did not exist. Vintar is able to link the benefits of home recording with the professionalism of the project studio by using professional equipment without the limitations of home recording.

⁸⁰The term standardization was first used in popular music by theorist Theodore Adorno. When Adorno "published his initial critique 'On Popular Music' in 1941, the music of the big bands filled the airwaves and the charts... Adorno was not opposed to popular music as such, but rather to its ruthless exploitation by the culture/music industries" (Shuker 2002, 137). Adorno criticized popular music for being 'standardized', whereby he claimed that composers and musicians were producing commercialized products for financial gain.

Chapter 5

THE LIFE AND TIMES OF GREG VINTAR

Greg Vintar is a Canadian musician who has worked in both project and production studios. Today at the age of fifty, Vintar reflects upon his experiences within the Canadian recording industry. In his lengthy career, Vintar has worked with some of Canada's most accomplished musicians, most notably, Earl Filsinger, John Till, and Kenny Kalmusky, who performed with The Band, Bob Dylan and Ronnie Hawkins. Currently, Vintar resides in Timmins, Ontario, where he operates a project studio and repairs musical instruments.

Vintar embodies the essence of a poverty stricken musician who is both anti-capitalist and anti-conformist. Through his inspirational work, he has influenced countless northern artists, emphasizing the creation of art for art's sake, and offering musicians an outlet to perform and record their music. Without Vintar's project studio, many musicians would never have had the opportunity to record locally, due to the geographic isolation of Timmins in northern Ontario.⁸¹ Vintar's immeasurable impact on the music scene in northern Ontario has created and fostered a sense of community among local musicians, earning him the respect of many. Charities that he is involved with include Sick Kids, Child Find, and the local food bank. Vintar has long promoted original music in Timmins through organizing benefit concerts which raise money for important and often overlooked local causes.

⁸¹Prior to the opening of Vintar's project studio, the nearest high quality recording facilities were located in Toronto, Ontario. Although others, such as Dream Catcher Studios, have since opened in Timmins, Vintar's project studio has been the only one to remain open for any length of time.

Over the past forty years, Vintar has worked in a multitude of musical genres including rock, blues, jazz, classical, funk and fusion, and has apprenticed with some of the most respected musicians and technicians in Canada and abroad. Vintar has a wealth of musical education that is unsurpassed. He has not studied music at the post-secondary level in an academic setting but has gained his knowledge through years of intensive practical lived experience. Vintar has become one of the most renowned teachers in northern Ontario, employing a constructivist method of instruction by which students are expected to do virtually everything on their own, including building custom equipment, mixing audio tracks, producing, and engineering. In so doing, Vintar has inspired countless musicians who otherwise would not have had the opportunity to participate in the production of music.

Vintar has worked with the many different studio technologies described in the previous chapters. A brief look at his career brings to life all of the equipment and methodologies discussed, and helps to ground the theoretical and technical issues raised in this paper. Greg Vintar's life touches on many interconnected aspects, among them: creativity, methods of production, commercialism, community, and musical expression.

THE PROJECT STUDIO

In 1991, Vintar purchased a home at 321 Balsam Street North in Timmins, Ontario. This home was purchased with one intention: to build a project studio that had the ability to produce high fidelity sound equal to Canadian production studios anywhere. Vintar knew that building a

home project studio would not be an easy task and that it would take years of construction and experimentation to achieve an acoustically sound room.

As discussed in Chapter 2, materials used to construct project studios were often scrounged to keep costs minimal. Vintar's home studio was no exception; materials from a variety of sources were used to keep costs low. Immediately following the purchase of his home, Vintar began constructing his project studio in his basement by removing everything from the surrounding area to set up a general template for his live room. Materials such as the wallboards, wood shelves, and planks were acquired free, or for little cost, from local television studios and friends within the community:

I really worked on the inside of the studio because I wanted a specific compression rate in the room itself. I didn't want one room to sound like one room, so with the different levels of compression throughout the room and various materials used as insulating devices, I had four distinctly different areas within one room. It was designed that way for a reason; I had an area that sounded great for the drums, while other areas were ideal for singing or for guitar amps, bass rigs or whatever the case may be. Either way, they sound really good in a specific area of the room (Vintar 2005).

In 1991, Vintar decided to use the room inside a room method of construction as described in Chapter 2. This method was used to keep vibrations and sound confined within the live room, while isolating and controlling external sonic disturbances. Vintar describes the room:

The majority of the walls are ten inches thick. This was done initially, so I had double sized walls with dead air space left between the two. The outside of the walls are up against my workshop, so I didn't care about anything fancy on the outside, but on the inside I was particular. I used all top notch quality materials.

You start realizing that after spending hours and hours at a time in a room, that if there is the least bit of damage done to your hearing, then it is a no go. It is not that I had that

happen, but there were certain areas of the room that I would stand in that I wasn't happy with the overall tonality. I started shifting things and taking entire walls down and [then] put the whole thing back up in a different structure of density. I would angle the surface of the wall, nothing overly specific, but there was an angle to the walls. I did not build continuous internal surfaces in the room, I have break-up everywhere in that room for specific reasons. If I put an instrument in a specific corner, I would get a unique tone. What I wanted to do was create even more variables to give everything a really nice flux (Vintar 2005).

THE RECORDING PROCESS

Following the construction and structural alterations within the project studio, Vintar began experimenting and recording with the live room using two Otari MX7000 recording decks. One of the Otari decks had four channels available for recording, while the other had only two channels. The Otari decks were recording directly off a 1967 Stevenson console (see Appendix A, Illustration #34), which had the capacity to hold twenty-four tracks, yet only had eight strips (channels) in place due to financial restrictions and availability. The four stereo sub groups and master outputs from the Stevenson were sent directly to the Otari's recording on to a two-inch tape. Following the initial modifications made in the studio, Vintar began working with a blues group called Get Off The Stage.⁸²

By 1991, the band was eager to record in Vintar's project studio. Since the other members of the group had not recorded in a professional studio before, Vintar thought that it would be beneficial for the entire group to first visit an established production studio:

I took the band down to Studio A, in Brampton in 1991 to show them what the pros were doing compared to the home studio. Stuart MacArthur and Archy Hachey ran Studio A.

⁸²This group consisted of Greg Vintar (bass/vocals), Steve Clermont (guitar/vocals), Kevin McMahon (drums), Eric Boucher (keyboards).

We had some post production done at Metalworks [Toronto] in order to show them the difference between a straight analogue mix-down which we were doing compared to running things across the Pro-Tools rig at Metalworks. In any case, we had two songs done that were radio ready and were put on limited radio air play in Timmins. One of them was an anti-cocaine song, so we had used that for things like the D.A.R.E program which promotes drug and alcohol awareness. We would offer them that song so they could use it in their educational program (Vintar 2005).

MUSIC AND THE COMMUNITY

From an early age Vintar was a firm believer in the liberties of musicians, producers, and engineers. Vintar was surrounded by musicians and teachers that taught him the importance of being well-rounded in all aspects of the music business:

I was classically trained as a kid, and when I was thirteen my family moved to Stratford where I became influenced by Earl Filsinger, John Till and Kenny Kalmusky, because they played with Dylan, Ronnie Hawkins and The Band. All kinds of people would come to Stratford to jam-out. It was great because I was right in the middle of it. I saw this as being the reality of what a musician should be doing, but I also realized that you needed a gear-head to take the music and put it on to tape in order to get air play. What I did, was I took all of the things that I [had] seen around me and decided that I was going to become a guy that could do four or five jobs; so that way I could be completely independent of anything and anybody... No one is in control but me, I am the one driving the bus.

In the meantime you have to own a house to put all of this equipment in, and most importantly, you have to attract the right players. You don't want garbage, you want the best around so that your end product is great. The whole concept of the home studio is to have total control and independence. People started knocking at my door once they heard about my studio and all the gear that I have, so I was able to select who came over and who recorded at my studio. This was how Rude Dog was started, which was my next project after Get Off the Stage (Vintar 2005).

Rude Dog decided to use the same method of rehearsal/recording as described in Chapter 3 with Savard's project studio. Every rehearsal was recorded live off the floor to maintain a running documentation of all the performed material. Vintar used the 1967 Stevenson console to

mix the live recordings which were then sent to the Otari recording decks. Lori Bennett, Vintar's girlfriend at the time, was often left with the responsibility to do a live mix of the rehearsal and record the performed material on tape. Live off the floor recording was a successful tool for the documentation of rehearsals while producing an adequate product.

Live off the floor recording continued to be used as the primary method of recording in Vintar's home studio throughout 1992. When a track needed to be recorded at a professional caliber, additional equipment was brought in and several microphones were placed throughout the live room to achieve a greater sound texture.

We tried working with different people in 1993-94. Roland Plamondon would come in when I shot my commercials for the food bank drives at the college. These were the big once a year events, so we made a big production out of it and had television advertising. Rolly would come down and we would combine equipment and record live off the floor... Everything was done using live off the floor; vocals and all... We would end up using the final product as our track for the TV commercial. The local television crews would come over and video tape us playing in my basement and put our live off the floor tracks to the video (Vintar 2005).

Recording became an obsession for Rude Dog, but they were not concerned whether or not their music was being heard within the community; they simply viewed music as a means of obtaining personal pleasure.⁸³ The band did not plan on making a profit from live performances, nor were they marketing their music to mass culture. Special benefit concerts were among the few occasions in which the band could be seen in live performance. Vintar has always maintained a profound dedication to helping the community through charitable acts which

⁸³As noted in Chapter 4, some independent artists just play music for pleasure. The members of Rude Dog do not intend to become famous rock stars, they merely enjoy the creativity and independence their music offers.

involved music:

I would take certain original songs and go out and do events such as Sick Kids, Child Find, Food Bank, Wish Foundation. It didn't matter what these benefit jobs were. The point was that I would use one of our originals as the advertisement for the show. So I would get full song air play, not necessarily on regular rotation day play, because of corporate control, but I found a way to do it. This was taught to me in the 1970s, because we were doing benefits back then. We would go out and play original material from the studio and try to raise money. The benefit shows were always the vehicle to play our original studio material live. We are working for nothing and making money for a great cause, [while the venue would pay the overhead costs] but we wanted something out of it too, so we got air play. That was the trade off. This is what I designed, and I still do. I want people to hear original material and raise money within the community for a great cause (Vintar 2005).

Vintar felt that benefit concerts were not only a vehicle for musical promotion, but they also acted as a means of fostering community-building initiatives by encouraging musicians to band together to help the less fortunate.

PROJECT STUDIO METHODOLOGY

Multitrack recording, which is currently the most commonly used method of recording practiced within the rock genre, was not the recording method of choice used by Vintar. Through years of practice and experimentation, Vintar felt that live off the floor recording delivered a natural sound, which was reflective of the rock genre itself. Although Vintar's group did not use multitrack recording for their personal recordings, various artists that recorded at Vintar's project studio preferred multitrack recording.

Certain bands and individuals cannot get their heads around sitting in a room by themselves listening to a bed-track on headphones and playing along with it. It is just not the same as playing with a live band. It is the same concept as a drummer listening to a click track. This past summer while I was recording non-stop, at least four of the ten or twelve drummers who have passed through my studio lost the click track within the first

two bars. It was gone right away... Why even bother having one? It is a difficult thing, but if you take that drummer and throw him with the bass player, guitarist and vocalist outside of the room, basically live off the floor, it is not a problem. I grew up using both methods, so it really doesn't matter what method of recording I use (Vintar 2005).

Vintar continued to use both live off the floor and multitrack recording methods to accommodate his clientele. Project studios generally suit the needs of the individual, unlike production studios which insist on using one engineer's preferred method.

In 1991, as discussed in Chapter 3, digital technology including ADAT and DAT tapes revolutionized the recording industry. Vintar, along with many other Canadian musicians, began using DAT, and later ADAT, which produced a higher fidelity sound when converting analogue recorded material to digitally editable platforms. Although Vintar wanted to switch his recording devices to two-inch, reel to reel recording, he was unable to do so due to cost impediments. The Studor A80 and A812 (see Appendix A, Illustration #35), as described in Chapter 2, were used by Vintar's project studio with the use of quarter-inch tape. These machines were used because they were acquired at little cost.

MERGING DIGITAL AND ANALOGUE TECHNOLOGY

Vintar has often been criticized for being "anti-digital" since he would rather record using vintage analogue equipment than digital technology. However, Vintar came to the realization that if he wanted to facilitate the recording process and keep his studio up-to-date he would have to use digital technology.

I realized and I knew that I had to go digital, because I was getting somebody else to actually press compact discs. So the first thing that I bought to digitalize my studio was

an HHB CD burner. I patched this burner to a couple of ADAT machines. This ended up being our link to getting things into the computer. We were now going to use those [ADAT tapes] as the converters, so inevitably we started working on getting everything to work together (Vintar 2005).

At the time that Vintar began working with digital technology, data storage was an issue. Rather than using tape to store recorded tracks - like many studios had done for decades - a shift emerged whereby engineers began using digital computer hard drives as a means of storage. Although digital storage media were used within the project studio, Vintar did not want to eliminate the analogue process:

I was using the Alesis M20, which recorded material onto digital tape; this was perfect because it was reel [tape]. Tape does weird things, it stretches, has flux, but at least is not pure linear digital. I absolutely did not want a purely digital sound. With digital, a zero is a zero and there is no flux. So what we would do is combine some of the new stuff with the old stuff to get the ideal sound that we were looking for (Vintar 2005).

The amalgamation of digital and analogue technology resulted in a high fidelity sound that was easily editable. Vintar admits that although he prefers analogue equipment, the addition of digital technology to his project studio was essential. It took years of research and experimentation, but the merging of the two technologies resulted in higher quality post-production, ergo both analogue and digital platforms when combined complemented each other, but by no means could act as replacements for one another.

Notably, the conversion units that Vintar describes above are available in various forms: on-board soundcards in computers, and off-board rack-mount units. On-board computer soundcards have the ability to convert an audio file from an analogue signal to a digitally editable file. Although the transfer is possible on a home computer, a lack of overall sound quality is

audible. To achieve a high fidelity sound when converting a track from analogue to digital, expensive off-board equipment is required. In the case of Vintar's studio, the Alesis M20 is used as a conversion tool, using high quality digital tape.

Good conversion is very expensive, but trust me, there is a difference. There is no two ways about it. Some people are convinced that a converter is a converter, but that is far from the truth, you want to be using the best methods of engineering available (Vintar 2005).⁸⁴

The concept of digital recording was initially introduced to Vintar by James Mongeon, who became fascinated with digital technology in the early 1990s. Vintar has been an inspiration and mentor to many students including Mongeon.⁸⁵ Although Mongeon shared similar beliefs regarding sound recording, he contended that digital technology was a necessary component in modern studios. Mongeon began demonstrating the editing capabilities of the computer program *Soundforge* to Vintar, thus raising Vintar's awareness and interest in digital technology. Mongeon and Vintar began working as a team; Mongeon was heavily influenced by digital and computer technology, while Vintar was knowledgeable about analogue technology. Together they were able to incorporate the strengths of digital and analogue recording technology to avoid the often frail sound of digital recording, while having the warm texture and flux of analogue

⁸⁴As discussed in Chapter 3, Milstead claims that "there was a time when digital recording wasn't up to the accuracy of analogue tape recording, but things have changed" (Milstead 2003). Although digital recording and converters have gotten better, as Vintar explains, good conversion does make a difference; inexpensive digital converters lack quality and produce a frail timbre.

⁸⁵Vintar spends a lot of his time in Timmins' high schools teaching music students the technology involved in the production of music. Vintar donates his time to teenage musicians giving them an understanding of recording and live production. I have noticed that the average rock musician or fan, does not understand the 'behind the scenes' realities of recording and live performance. Therefore, Vintar performs a valuable service as he makes students aware of modern technologies and the personnel responsible for making the music industry.

recording. Digital technology enabled Vintar's project studio to edit and add effects to recordings with ease, unlike analogue technology that required tape splicing and manual editing.

THE MCI CONSOLE

In an ongoing pursuit to maintain contemporaneity, Vintar, in 2000, traveled to Thunder Bay, Ontario, to visit his life-long friend and fellow studio owner, Rob Jardine, to inspect his new studio setup. Vintar was aware that Jardine had recently acquired an MCI console that was formerly the property of the CBC (see Appendix A, Illustration #36).⁸⁶

I started telling Rob that I am still using the Stevenson and some Mackies and basically whatever else I could scrounge-up. Rob started laughing at me and walks me into his live room to show me another MCI 600. This other MCI came from a mobile rig from CBC, so it was actually a 628 set up for mobile. It had no patchbay, and you cannot operate these things without a patchbay. I knew I had to re-build it, so we stripped it and took the thing apart (Vintar 2005).

Jardine has been affiliated with the CBC for a number of years. Through his inside connections he could acquire used equipment at a fraction of the cost. Vintar states:

Jardine was able to get the stuff while it was fresh, not after it sat for 20 years. So anyhow, we stripped the board down that weekend and thankfully Mongeon was with me with his truck, so I cut a deal right on the spot. Other people wanted the MCI console, obviously, it is a ninety-five thousand dollar board new, I mean who wouldn't want it? (Vintar 2005).

Due to the size of the console, Vintar was unable to fit the massive mixer into his home and as a result was forced to wait until spring to move the console in. This undertaking necessitated the removal of the entrance of his home. The console was wheeled in on a homemade roller bed. Once inside his home studio, Vintar began taking apart every piece of the console, including the

⁸⁶As noted in Chapter 2, many project studio owners acquired used equipment from various sources. Some individuals, including Vintar and Jardine, were fortunate enough to acquire used equipment from the CBC studios.

connectors, cabling, strips and power supplies to commence the restoration process. After this laborious task, Vintar placed the console in his production room where he began testing the board. To his satisfaction, everything functioned adequately, including the analogue to digital conversion mentioned above. Vintar elaborates:

I knew that technically that things were fine, but from the get go... (*pauses*) I had this dream, and it was about tone (*laughs*), so I woke up one morning and I phoned Mongeon. I picked up the manual looking at capacitors and I called the company and said, I need 500 of this capacitor and 500 of that capacitor, next thing I knew, I ordered 5000 caps that all had different values. I knew that making a change in all the capacitors clean across the board would level out the tone. You see, what happens with capacitors that are on continuous duty, you might get 7 to 10 years out of that... The capacitor will roll off certain areas, so the tone that is coming through only takes a specific frequency band width. So this MCI had precision caps in it, but I wanted them fresh. Doing this change gave me the fresh tone that I wanted. I did not do this to the entire board, because there are certain channels that I am getting a great tone out of and I didn't want to lose (Vintar 2005).

Upon completion of the restoration of the MCI, a patch bay was needed for the console to properly function and record. Therefore, Vintar was forced to start another labor intensive project. He began working fewer hours at his job to tackle the undertaking, which understandably resulted in financial restrictions. In the end, Vintar estimates that the project took him over fifteen-hundred hours to complete.

Obtaining a legendary console like the MCI 628 had been Vintar's lifelong dream. His project studio was operating sufficiently with the Stevenson, although obtaining parts for a console from 1967 was difficult. The Stevenson had the ability to hold twenty-four channels, yet due to the rarity of parts, Vintar had been unable to fill the empty strips though he had been trying for over twenty years. Although the MCI was a major project to refurbish, it enabled

Vintar's project studio to produce a final product unparalleled in Timmins.⁸⁷

Using the various conversion processes mentioned above, Vintar's studio has enabled local musicians to convert any form of media to a digitally editable product. Vintar has taken analogue formats such as cassette, A-Dat, DAT, open-reel and record, and transformed them all into digital wave files.

In the 50s, sometimes engineers would either put the final product to a tape or directly to a press. People that would play at CFCL [Timmins' local radio station], doing a telethon or a Saturday afternoon show ... would press the recording live right there. So now, there are old guys around town that have in the past 15 years or so, wanted to hear their recordings. I have been taking records (in the 78 format) and transferring them to disc or cassette, so that these old guys can actually listen to them again. So I keep very high end record players that can do 16, 33, 45 and 78's so I can do that type of transfer for people. So anything to anything, analogue or digital we can do. This took a while to work out technically, but now things are done very smoothly. It is a lot of work, but I really enjoy that end of the music scene (Vintar 2005).⁸⁸

A COMMUNITY APPROACH TO RECORDING

To contextualize Vintar's contribution to the Northern Ontario rock scene, the geography of Timmins must be understood. With a population of 45, 000, Timmins is a fairly isolated community which is, and has been, home to countless talented musicians, among them, Stompin'

⁸⁷Following the addition of the MCI console, Vintar was able to produce extremely high fidelity recordings. In June of 2005, Vintar recorded and produced a piece called *I Love Thee*. This piece was composed and performed by Barry Promane and his soon-to-be wife for the occasion of their wedding. I was very impressed by the quality of the recording that Vintar was able to produce. Vintar has given Timmins a studio that produces products similar in quality to production studios such as Metalworks.

⁸⁸As demonstrated in this quote, Vintar is not only able to record high fidelity products in an isolated area, but he is able to convert older recordings into modern digitalized products. This is important to aging Timmins musicians because these individuals have fond memories of their musical careers, yet before Vintar, were unable to relive their experiences.

Tom Connors and Shania Twain. Music is a means of gratification that enlivens long, cold and dark winters. In Timmins there are no professional production studios. Thus, Vintar's project studio serves as an outlet for many aspiring musicians to record both full-length and demo albums. In the past, in order for a rock group to produce a professional quality product, an entire band would have to travel to a major centre, such as Toronto. Due to financial restraints this scenario is rare to say the least. The expense of traveling and high hourly studio rates impedes aspiring musicians. Because of Vintar, the door has opened for countless musicians to participate in the recording process. Wherever Vintar resided, he always felt a need to form a collaborative coalition for musicians in the community.

I used to go out and jam with about 40 musicians in my early days and everybody would know their place; everything was smooth and mellow. By the end of the night, everybody would end up playing, writing or recording. It was a communal effort that made things a success. I have tried to do that wherever I live; I did it in Thunder Bay and I have been doing it here [Timmins] for years. I actually called it the Timmins Musician's Co-Operative, and used to call it the Federation of Northern Rock Recording Artists, I ran that thing, but I created a facade. It was only me, but it looked like it was a huge organization. I would use this to attract musicians to come and record here with me, recording my songs or recording their own stuff. It wasn't just to record, it would be for benefit work to raise awareness of original material while doing something good for the community; so it was double ended. I found a system that works to get the best of both worlds. This way I could promote original material and artists in this area, plus I could do something good for the community (Vintar 2005).

Since many of the aspiring musicians recording in Vintar's studio are his friends, he charges minimal rates. Rather than charging by the hour, Vintar sometimes negotiates a deal with musicians involving favours whereby they donate old equipment to the studio in exchange for studio time.⁸⁹

⁸⁹As discussed throughout this thesis, project studio owners, particularly Vintar, seek used equipment. It does not matter whether or not the equipment works because Vintar is able to fix almost anything. Vintar acquires anything from power amplifiers and compressors, to guitars

The recordings produced at Vintar's studio enable northern musicians to produce and promote themselves. With modern technology, the artist is able to package and print the final version of the master tape from Vintar's studio which allows them to sell their product in local music stores. Likewise, musicians are able to play audio excerpts on the Internet by utilizing file sharing programs and websites in the hope of obtaining invitations to perform live shows.

Several attempts have been made to open high-end project studios in Timmins, including Dream Catcher Studios owned by Dan Chartrand, but the economic climate of Timmins could not sustain such a venture. Vintar, on the other hand, slowly began operating his studio from his home rather than creating a large profit-generating company.

As described in previous chapters, there are three major divisions in recording methodology: project studios, production studios and home recording. All of these methods of recording produce varying degrees of quality depending on the finances available. Vintar's studio is ideal because it is a high level project studio that operates on a minimal budget. Vintar has contributed to the Canadian recording scene by opening his studio and encouraging individuals from northern Ontario to pursue music. Like many other project studios, Vintar's success can be attributed to the cooperation of various community players who assisted in the construction and maintenance of the studio. Although Vintar's studio produces high fidelity products in relation to other Canadian project studios, there is still a clear line in terms of production, staffing and overall quality that can be drawn between home, project and production and bass amplifiers.

studios.

Conclusion

This thesis has been an exploration of how technology and recording have impacted the Canadian rock musician. Technological advancements have been responsible for the digitization of the Canadian recording industry. Although many advancements within the recording industry have been made by Europeans and Americans, this overview shows important contributions to recording in a Canadian light.

Since the beginning of sound recording, Canadians have made significant contributions to technology and recording methodologies. In 1919, Royal Air Force officers, Lionel Guest and Horace Owen Merriman, developed electronic recording using a microphone. Prior to the advent of the microphone, both flat discs and cylindrical recordings had trouble capturing high and low range frequencies; they were only able to capture mid-range tones. With Merriman and Guest's invention of the microphone, previously unattainable high and low range frequencies could now be captured on recordings.

Following the Second World War, magnetic tape recording began replacing flat disc and cylindrical recording mediums. Magnetic tape recording enabled a greater length of recording time and a higher fidelity of sound. Although American musician and recording pioneer Les Paul has been credited with creating multitrack tape recording, many Canadians find this controversial. Ottawa's Hugh LeCaine, around the same time, created a much more sophisticated

device called the variable speed/special purpose tape recorder. This device not only had the ability to multitrack tape record, but was also able to record and play back at variable speeds. Unfortunately, LeCaine's device was never commercialized, but his devices helped set the foundations for modern multitrack sound recording.

Technology has evolved at a rapid rate, greatly effecting the production of sound recording and the entire music industry. I have categorized and distinguished the Canadian project studio, production studio, and home recording studio and documented the roles of the rock musician, studio personnel, and label management. Academia has failed to document and distinguish the roles of Canadian studios listed above, specifically the project studio and its benefits for musicians in isolated regions of Canada.

Following the implementation of the CanCon quotas in 1970, Canadian rock musicians scrambled to find adequate recording facilities to attract the attention of a major label. The CanCon regulations inspired musicians and engineers to create the project studio; a place where independent and amateur musicians could record at a fraction of the cost of professional studios. Project studios were uniquely fabricated due to their use of scrounged materials. These studios were generally constructed in homes, office buildings, or barns. The physical structure of these buildings was fabricated through years of experimentation. As noted in Chapter 2, project studio owners experimented with an assortment of sound insulating devices. Some of these devices include egg cartons, sloping walls, angled glass, high density foams and double doors. These experimental steps used to create the project studio proved to be so effective they impacted the

Canadian building industry.⁹⁰

Project studios have enabled musicians in isolated regions of Canada to record and distribute their music internationally. Within the geographical vastness of Canada, the distribution of sound recordings is essential for the success of any musician. How would music be dispersed across such a large land, particularly to remote northern locations, had not recording technology come to the rescue? Although project studios have had a major impact on the Canadian recording industry, production studios, specifically those of the CBC, have had an active role in tying Canada together as a nation.

The CBC was created in 1936 as a publicly owned national broadcast system to succeed the Canadian Radio Broadcasting Commission established in 1932. The government quickly realized the importance of the CBC as a tool for unification.

The CBC's importance in the cultural and social fabric of Canada is incalculable, whether it is engaged in the quick dissemination of news across the world's second-largest country, in the spreading of cultural nourishment to outlying areas hundreds of kilometres from the amenities of urban life, in creating and supporting the employment of musicians, or in commissioning and providing exposure to Canadian compositions. No other single organization has played so large a role in making Canadians and the outside world aware of Canadian cultural pursuits and in helping these to flourish (Canadian Encyclopedia of Music 2006).

From the 1970s until the present day, the CBC has had an abundance of studios dispersed across Canada. I believe that these CBC studios are largely responsible for the creation of the project studio. Because the CBC studios have outposts across Canada, including northern

⁹⁰Inspired by their efficiency in recording studios, modern homebuilders began using hollow metal doors with baffling to keep out extreme temperatures and noise.

regions such as Yellowknife and Whitehorse, project studio owners were able to acquire used professional equipment at a modest rate.⁹¹ As discussed throughout Chapter 5, project studio owners Rob Jardine from Thunder Bay, Ontario, and Greg Vintar from Timmins, Ontario, acquired used MCI consoles originally used by the CBC, making their project studios operate at a professional level. By selling used equipment to crafty engineers such as Vintar and Jardine, the Canadian government indirectly promotes recording in isolated regions of Canada.

Although the project studio remained the most prominent recording studio for amateur rock musicians throughout the '70s and '80s, by the '90s digital home recording developed, drastically changing the face of sound recording. The advent of home recording can be attributed to the rise in computer and digital technologies. Like project studio creators, home recording enthusiasts were able to acquire inexpensive recording equipment and record in the luxury of their homes. In order to produce an adequate product from home, all that was needed was a home computer, a console and some live performing equipment. Home recording has enabled musicians without a vast knowledge of sound recording to produce from home marketable materials that surpass the quality of production studios of the '70s. Sony/ATV Music Publishing Canada's president Gary Furniss, mentions that "you no longer need access to top studios - technology has allowed us to build a lot of things on our own to a higher professional level" (Krewen 2006). Computer software, including MIDI technology has allowed artists to easily edit recording tracks without the use of dated editing methods including tape splicing. Once again it was a Canadian initiative that allowed the development of this important tool, the MIDI, as its

⁹¹The impact of the CBC's studios on project studios is a topic that requires much more research. Beverly Diamond has pointed out the vibrant recording scene in northern Canada, yet the effectiveness of the CBC on these studios has not been examined (Diamond 2001, 1281).

initial concept was developed by Ralph Dyck in Vancouver.

Due to these changing technologies, musicians, with the use of the Internet are able to disseminate and promote their own music independently from home. Nowadays, virtually every aspiring rock musician has a website where audio samples of original music are made available. Websites also serve as a promotional tool for band biographies, photos, album art and album sales. Independent Canadian musicians are now able to record from home, or for a reasonable price in a project studio, and be independent from powerful labels.

Because of technological advancements, musicians are able to assemble and fully promote an album from home. Computer software, such as Adobe Photoshop, enables the artist to create professional quality album art for a fraction of the cost of what a graphic designer would charge. Adobe Photoshop makes importing digital images easy, while creating endless possibilities for original album artwork.⁹²

Satellite Radio is a recent and controversial development that must be addressed. Like the Internet, satellite radio possesses both positive and negative implications for the Canadian recording industry. Satellite radio is beneficial for the musician because it enables independent artists that do not have a large sum of money to promote original material and thus sell their

⁹²For additional information on Adobe Photoshop, visit www.adobe.com/products/photoshop.

recorded goods.⁹³ Unfortunately for Canadian musicians, satellite radio does not have any CanCon regulations; therefore, satellite radio is highly dominated by the United States. In my opinion, satellite radio will ultimately promote Canadian talent. Comparable to the effects of the project studio in isolated regions of Canada, satellite radio will promote and disseminate products for the independent artist.

As illustrated in Figure 1 from Chapter 4, musicians and corporate executives are constantly in a struggle for power, which is often a losing battle for the musician. In recent years, a significant shift has occurred, propelled by the rise of project and home recording studios, which has enabled aspiring musicians to succeed in the music industry without the support of a major label. As noted in Chapter 4, musicians are left with a choice: they may choose to become independent artists or abide by corporate practices. Both avenues have pros and cons; the independent musician generally has more control, but may not have the finances available to record in a professional production studio. Musicians that are signed to a major label have the opportunity to make a lot of money, obtain international fame and perform in large venues. As noted in Figure 1, musicians may travel down many avenues seeking full creative control. Unfortunately, full creative control is rarely attained by recording artists within the Canadian rock recording industry.

⁹³Alan Gollom from Toronto, Ontario, expresses his views on CanCon and satellite radio by stating, “current content rules only encourage radio stations to play the same old tired artists over and over and do nothing for new artists” (Indie Pool 2006). Bob Hawkins from Orillia, Ontario, believes that “Canada needs more independent airplay. The current system is inadequate and based solely on the whims of the 'big name' record companies. Leaving little room for real 'art' to be portrayed” (Indie Pool 2006). Many Canadians believe that satellite radio is the solution for Canadian independent artists. For additional statements from Canadian musicians regarding satellite radio, visit <http://www.indiepool.com/comments/satellite.asp>.

As noted from personal experience, studio personnel can have an overpowering influence on the manner in which compositions are recorded, so the musician should be wary. As noted in Chapter 4, musicians that take part in ‘jam sessions’ such as those that take place in Rick Savard’s project studio, often play music for sheer pleasure rather than in pursuit of recording contracts. Therefore, as illustrated in Figure 1, being a Canadian recording artist is difficult, and the decisions made by musicians, including choice of management and record label can greatly effect their careers.

Debatably, the advent of sound recording has been the most important innovation in the history of music. The digital revolution has had a major impact on the recording industry. Digital technology, including the Internet and home computers, has allowed artists to be independent and free of major label control. Although the Internet and home studios are beneficial for Canadian musicians in remote areas, the Internet has also enabled users to share musical files, which many recording artists believe will have a negative effect on their careers.⁹⁴ Home recording and the Internet have helped Canadians share their music internationally, but it is unlikely that home recording will ever dominate the recording industry. In my opinion, production studios will continue to be the dominant source of sound recording used by professional musicians. Home and project studios simply do not have the financial resources

⁹⁴Many Canadian groups are opposed to file sharing. Ed Robertson from The Barenaked Ladies states: "I'm totally fine with people downloading music, as long as they steal everything that they want. If you want pants, go steal them. If you need gas in your car, you should steal it, because you can. As long as people are consistent I don't have a problem. As long as they see themselves as thieves in general then I don't mind if they steal everything that they like. But it irks me that it's only okay to steal music" (P2PNet 2006).

available to purchase the most up-to-date technologies. Project studios, home studios and production studios all have their respective places within the Canadian recording industry and each is needed to ensure the survival of the industry. As noted throughout this thesis, the project and home studios have greatly aided musicians in northern isolated areas of Canada to record and distribute their products. Still, recording is relatively new; in the past hundred years it has given the entire field of music across all genres a major transformation. Clearly, the face of Canadian music will continue to change along with the technology.

Appendix A

RECORDING EQUIPMENT AND MUSICIANS

ILLUSTRATION # 1

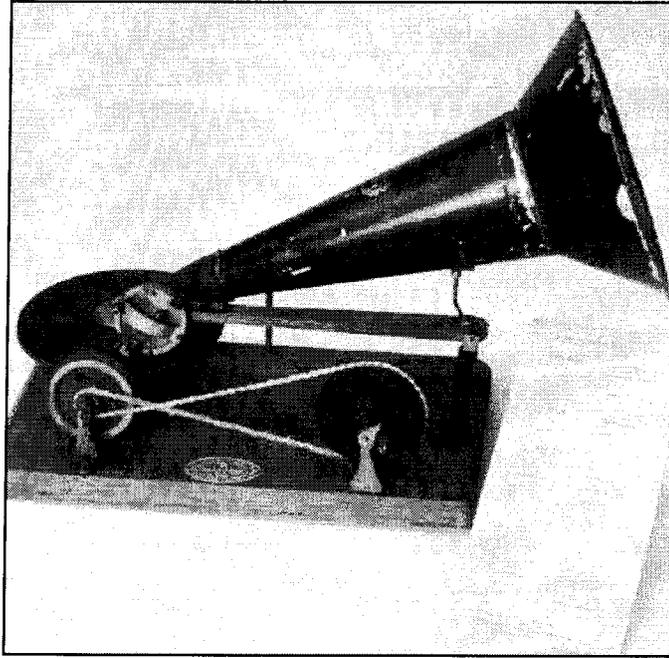
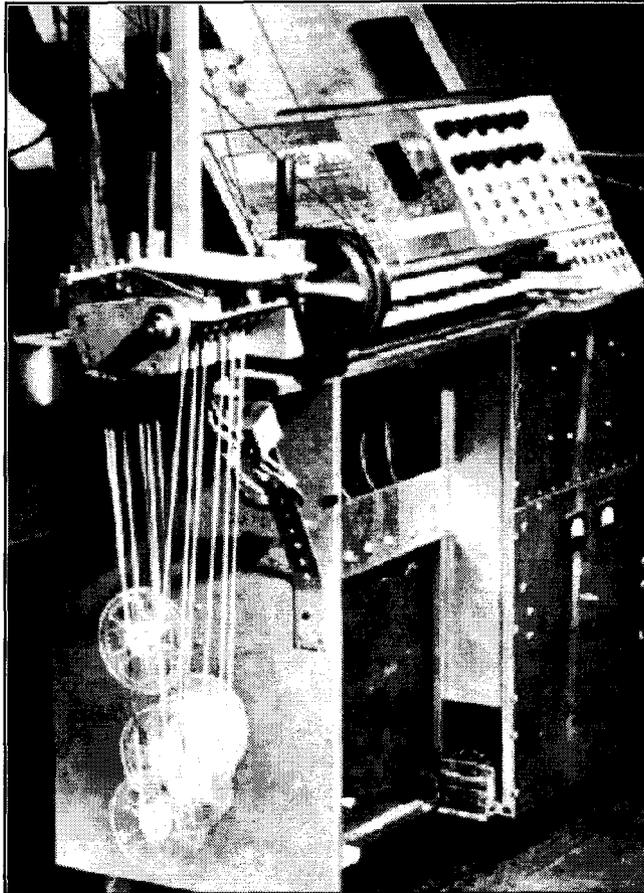


Image courtesy of inventors about.com

Gramophone machine from the mid-1890s owned by Thomas Edison himself and invented by Emile Berliner.

ILLUSTRATION #2



Hugh LeCaine's Multi-purpose machine.

ILLUSTRATION #3



Image courtesy of Liebrand Audio Images, 2005

The Studor A80.

ILLUSTRATION #4

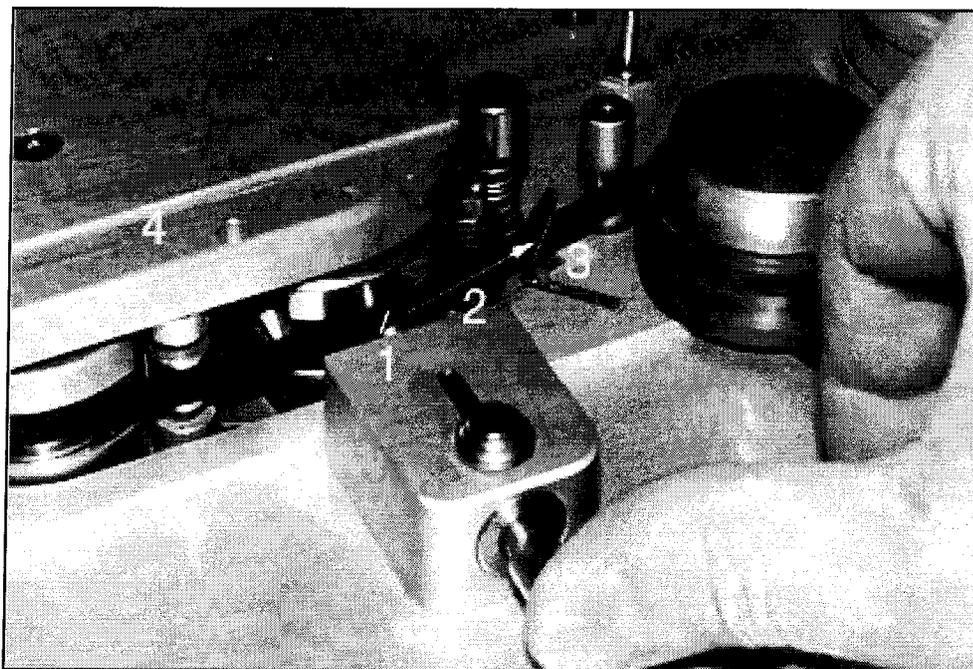


Image courtesy of Liebrand Audio Images, 2005

Demonstration of tape splicing.

ILLUSTRATION #5

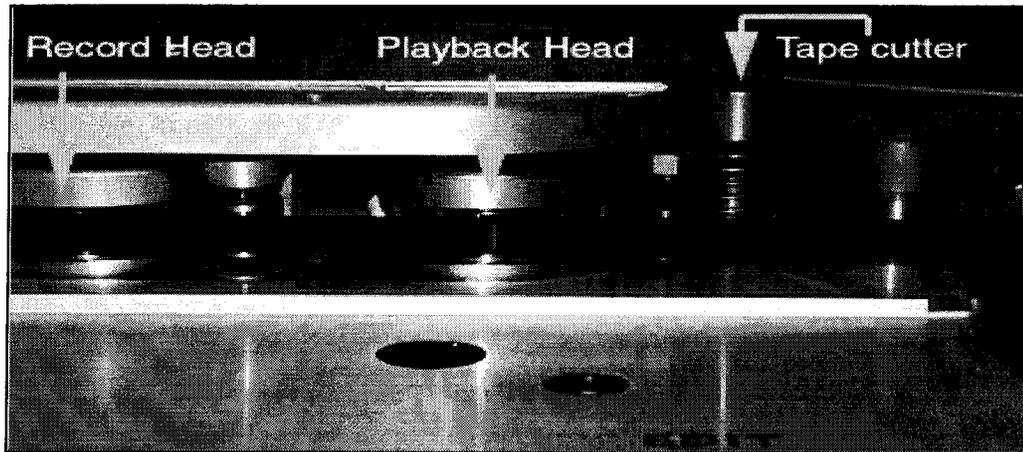
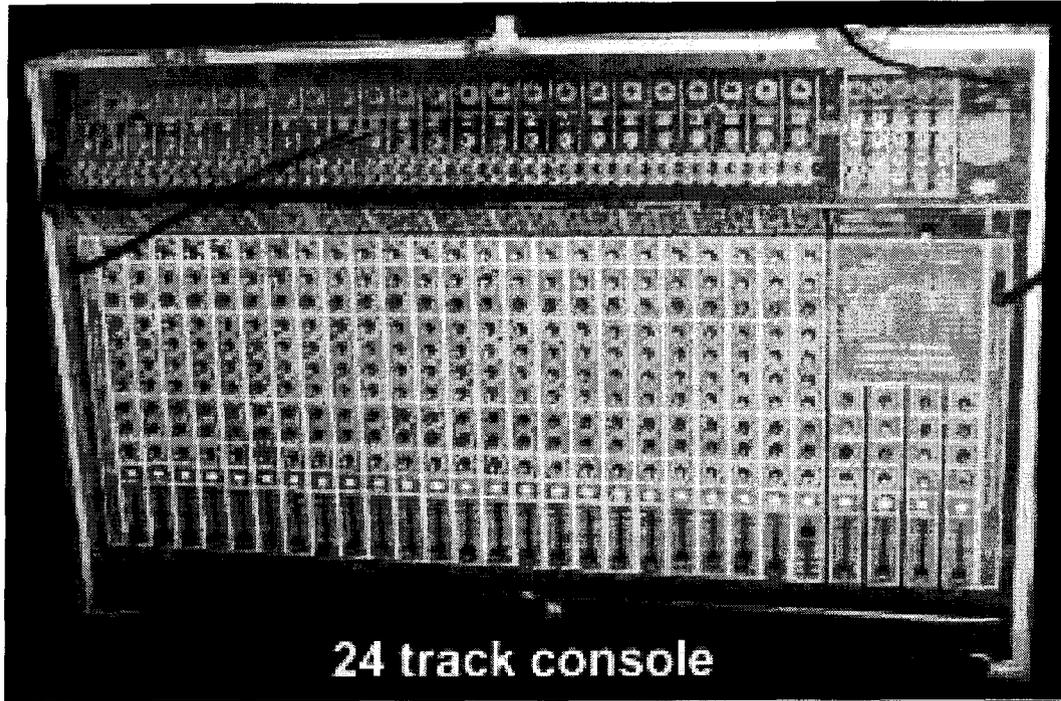


Image courtesy of Liebrand Audio Images, 2005

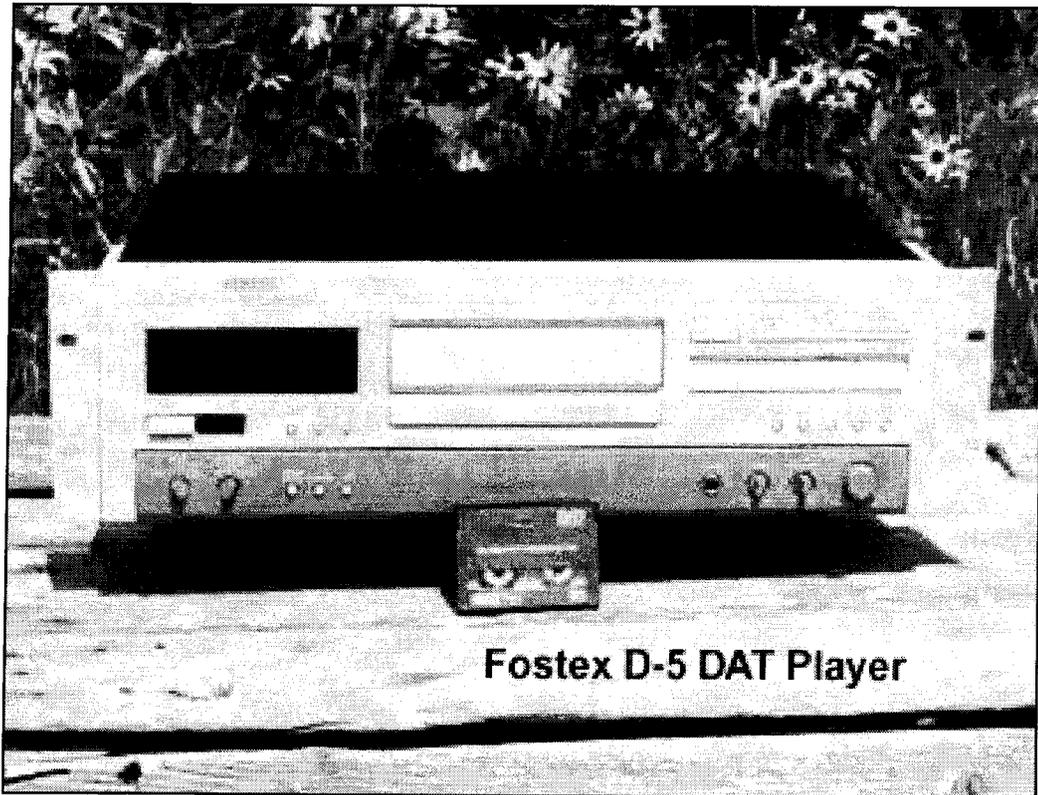
Demonstration of tape splicing and the its functions.

ILLUSTRATION #6



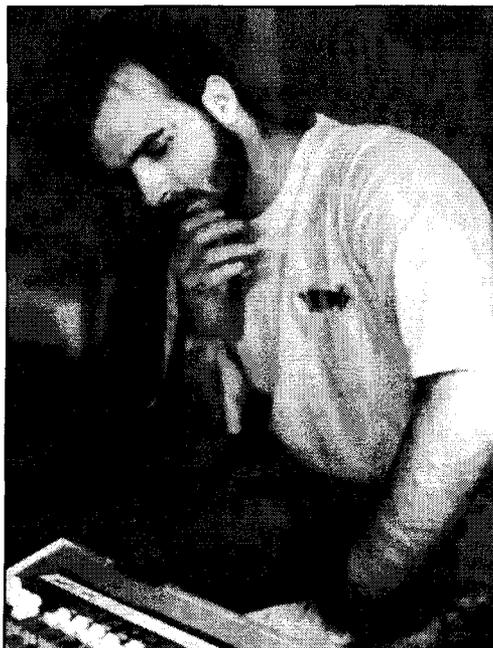
Twenty-four track mixing console.

ILLUSTRATION #7



DAT machine.

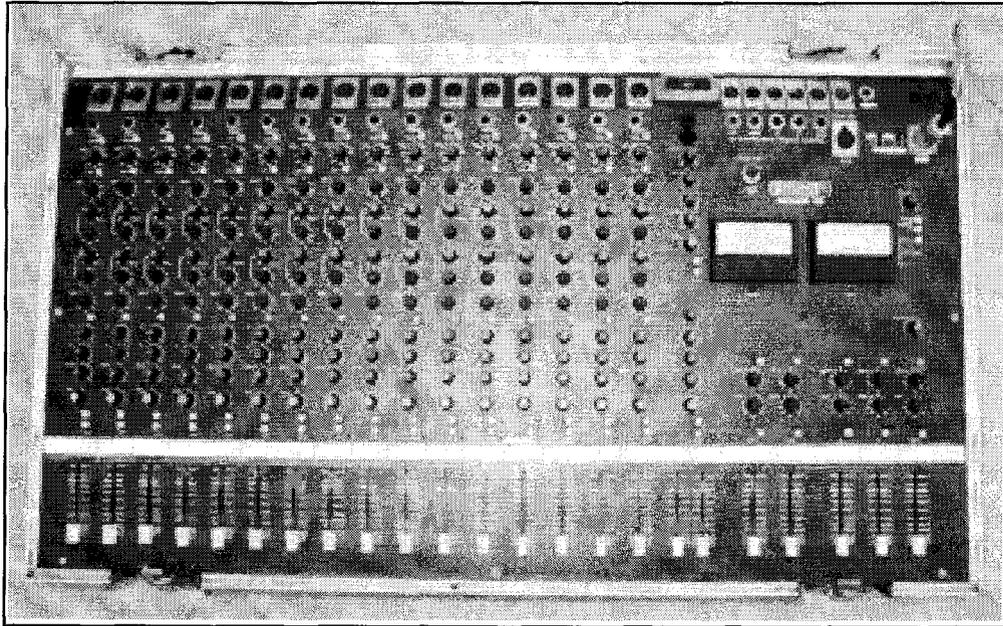
ILLUSTRATION #8



Images courtesy of James Mongeon.

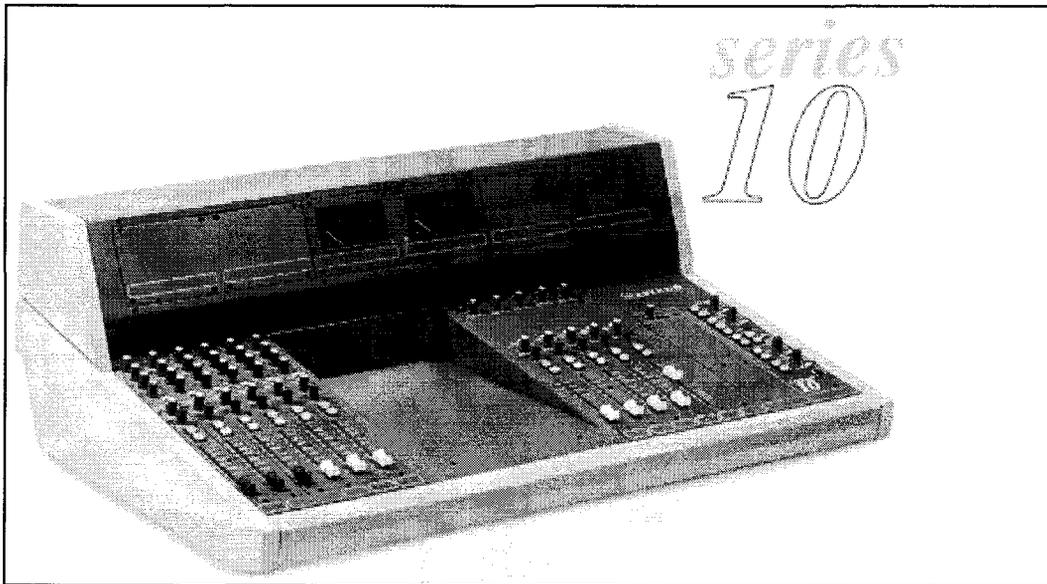
James Mongeon, a well respected sound engineer and producer from Timmins, Ontario. Mongeon is a member of the Audio Engineering Society (A.E.S.), and owns a production company named Soundwise.

ILLUSTRATION #9



The Soundcraft S-1.

ILLUSTRATION # 1 0



Tascam Series 10.

ILLUSTRATION # 1 1

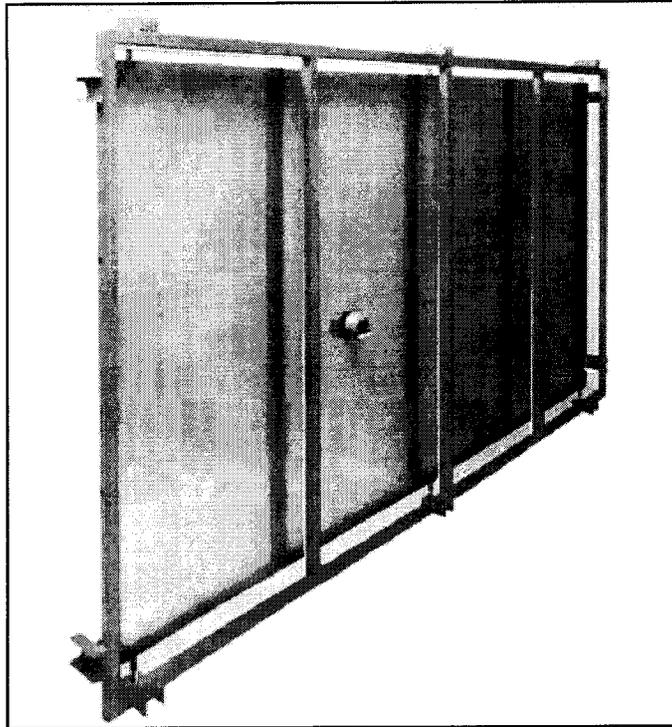


Image courtesy of Pro Sound Web

Plate Reverberation.

ILLUSTRATION # 12

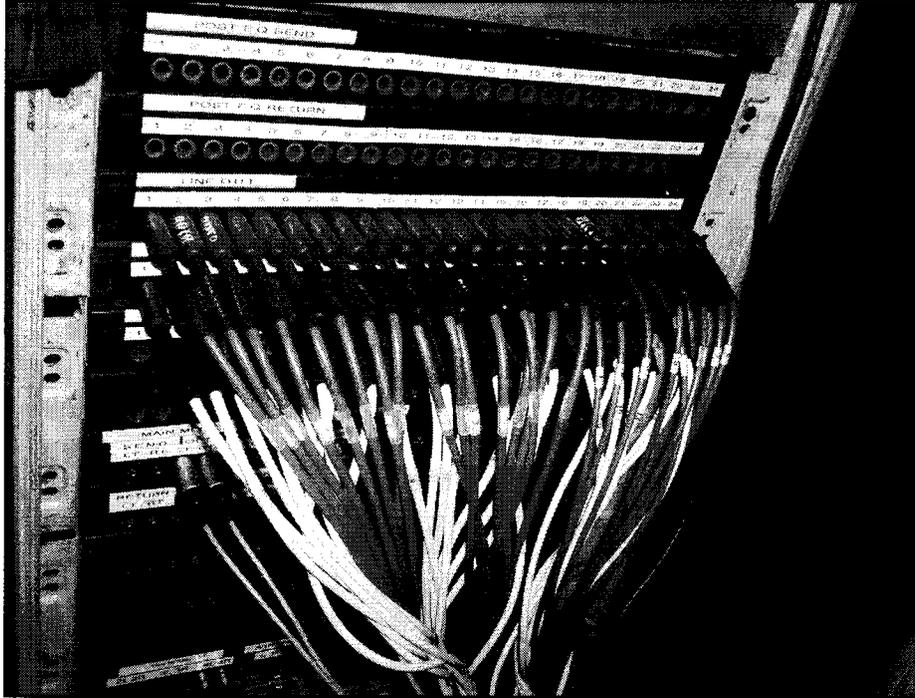
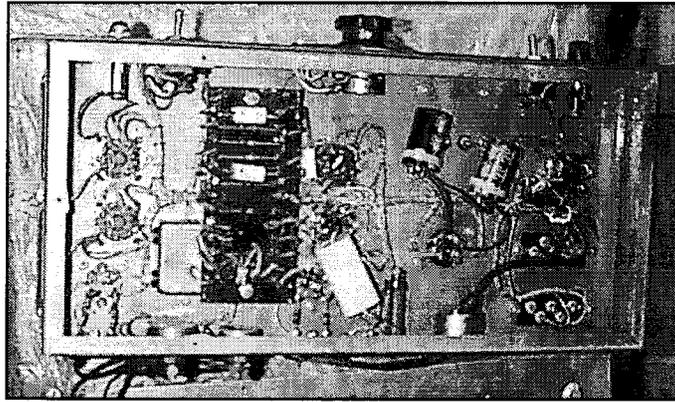
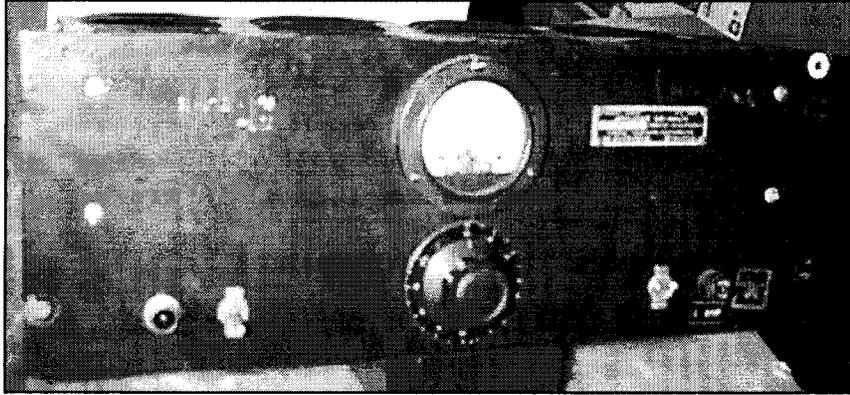


Image by D. Promane

Patchbay from Greg Vintar's project studio.

ILLUSTRATION # 13



Images courtesy of Monagar.com

Audio Compressor and inside components.

ILLUSTRATION # 14



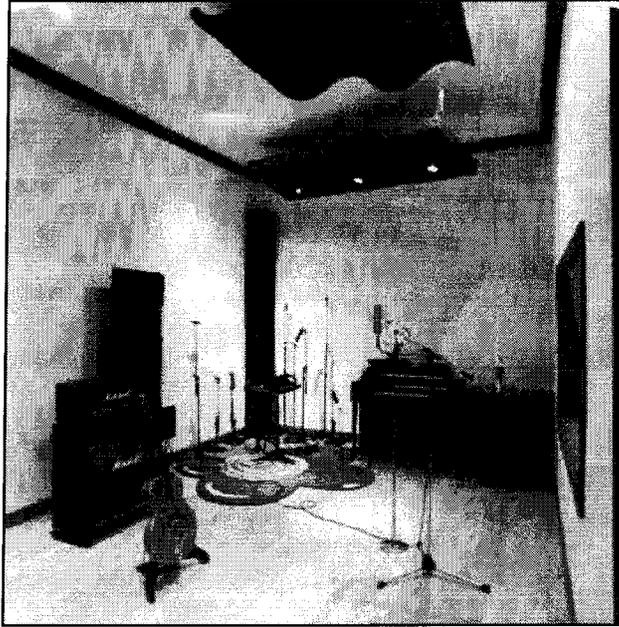
Fairchild 670 audio compressor.

ILLUSTRATION # 15



The Production Studio.

ILLUSTRATION # 16



The Live (or Main) Recording room.

ILLUSTRATION # 17

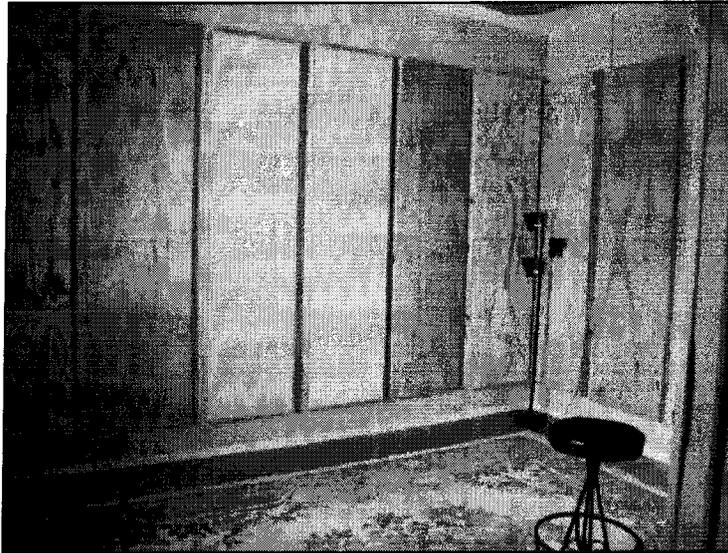


Image courtesy of Orion Sound

The Recording Isolation room.

ILLUSTRATION #18

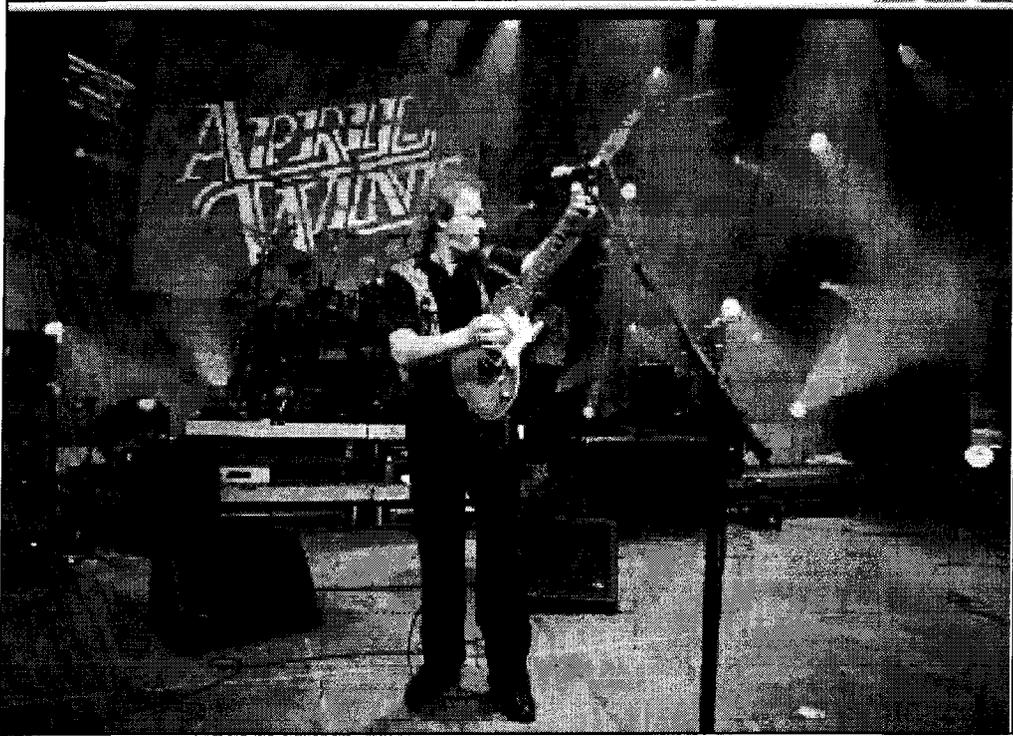


Image courtesy of April Wine.ca

Arena Rockers April Wine featuring front-man Myles Goodwyn.

ILLUSTRATION #19



Image courtesy of Presto Recording

The angled glass featured in the production studio.

ILLUSTRATION #20



Image by: D. Promane

Off-Board rack effects units.

ILLUSTRATION #21

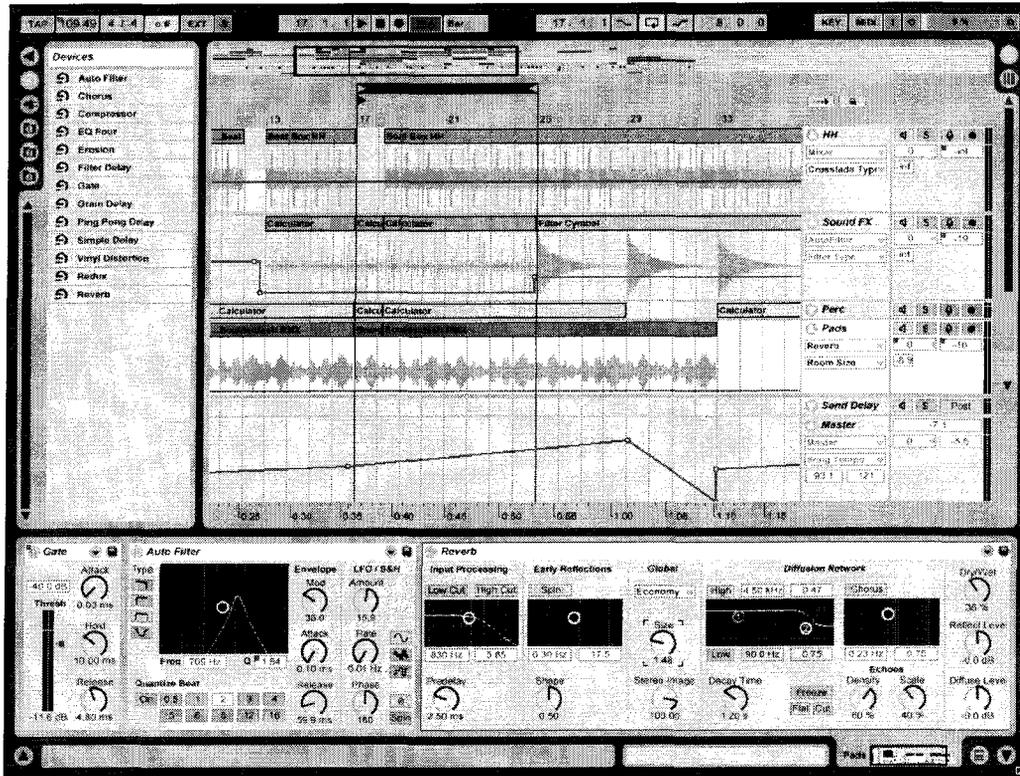


Image by: B. Promanc

Digital manipulation on a home PC.

ILLUSTRATION #21



Image courtesy of B. Promane

A high-end home recording studio. Note the dampening materials on the ceiling.

ILLUSTRATION #22



Image courtesy of James Mongeon

Rick Savard.

ILLUSTRATION #23



Images by D. Promane

Jonathan Heard, sound/guitar technician and tour manager for *Promane*. Heard was an essential member in making *Promane*'s national tour a success.

ILLUSTRATION #24



Image courtesy of Turning Into Salt

Dean Grenville, bassist from Turning Into Salt.

ILLUSTRATION #25



Image courtesy of Tuning Into Salt

Caleb Abbott, drummer from Turning Into Salt.

ILLUSTRATION #26



Image courtesy of Promane.ca

The group Promane. From left to right: Dave Promane, Dylan Roberts, Barry Promane, Shaun Brown.

ILLUSTRATION #27



BARRY C. PROMANE

Barry Promane, lead vocals, bass and keyboards in the band *Promane*. Promane is a Ph.D. Mus. candidate at the University of Western Ontario.

ILLUSTRATION #28



Image courtesy of Stone's Throw

Stone's Throw, live on the Molson Canadian Rocks Tour: Paul Duchesne, Christian Rivet,
David & Barry Promane and Emit Brown.

ILLUSTRATION #29



Image courtesy of Promane.ca

The cover of the album *Stages* by *Promane*.

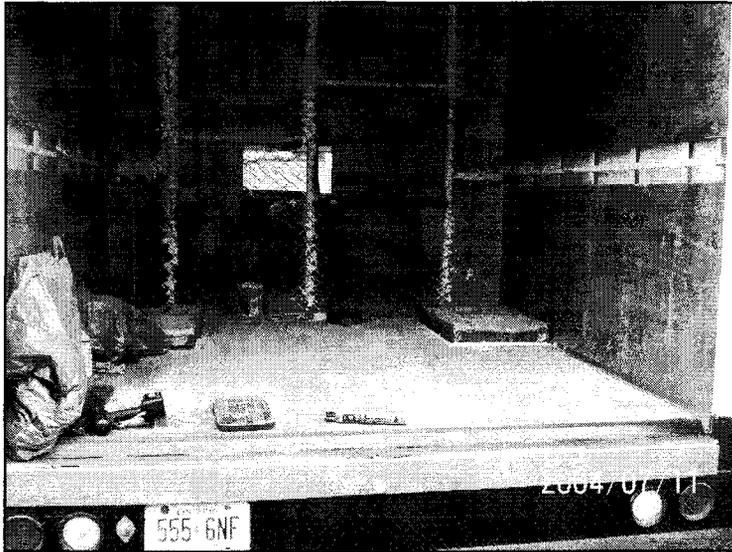
ILLUSTRATION #30



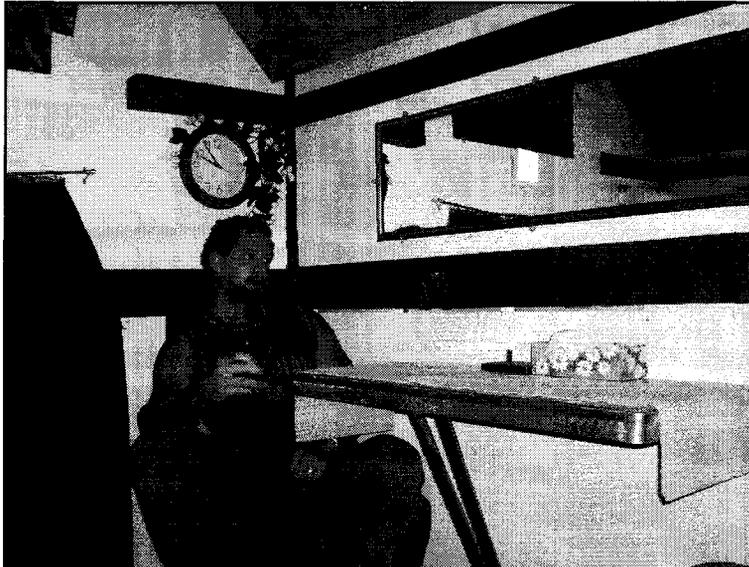
Image by D. Promane

Stephen Rollins and David Promane.

ILLUSTRATION #31



The cube van used by Promane prior to its conversion and modifications.



The inside of the cube van following Dave Promane's modifications. A fence was placed in the middle of the van, thus dividing part of the van into an R.V. for band mates to relax and the other half to store equipment.

Illustration # 32

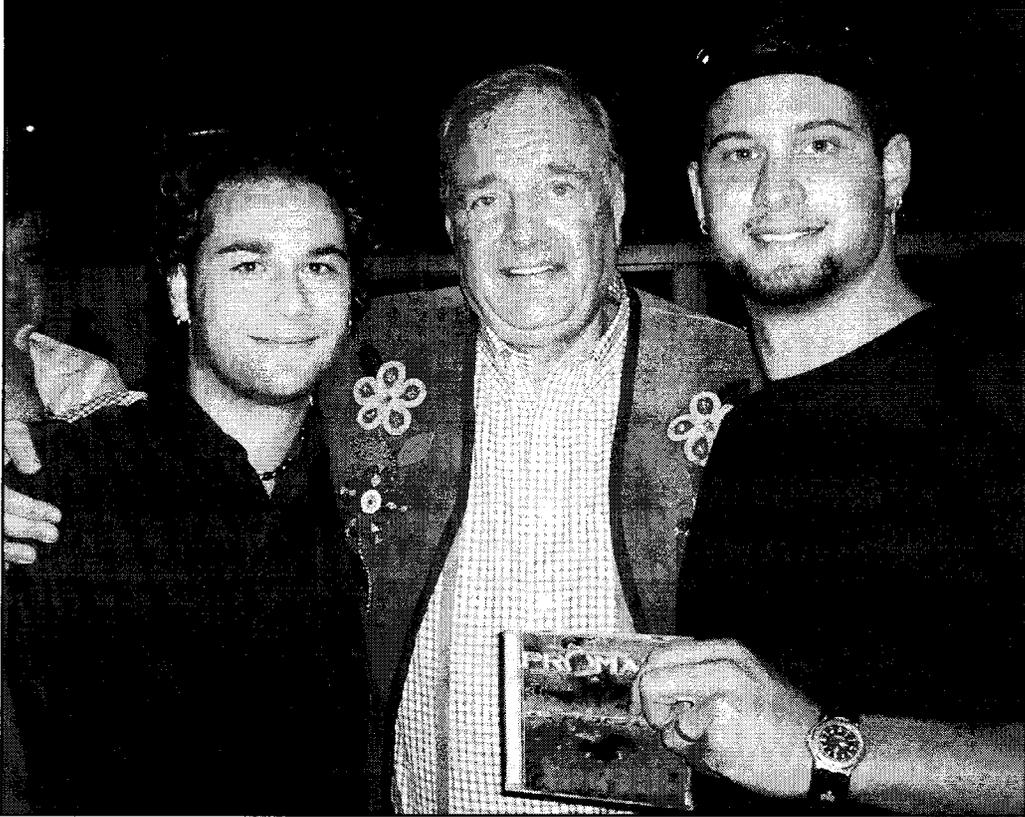
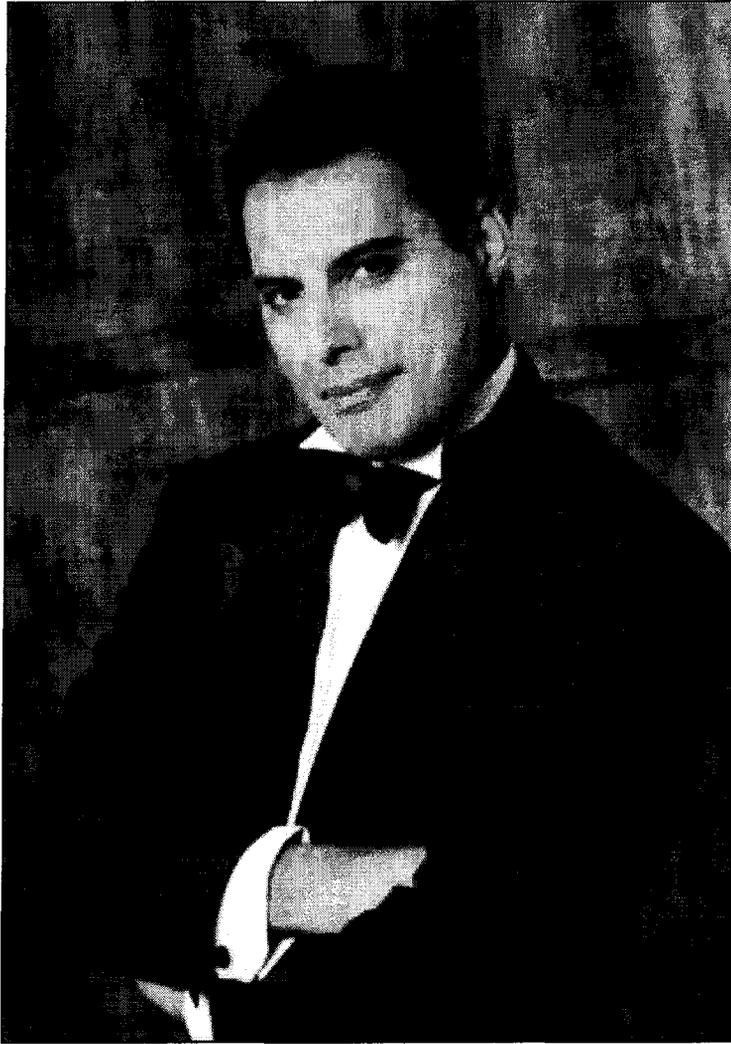


Image by Jonathan Heard

Barry and David Promane with Prime Minister Paul Martin.

Illustration # 33



Freddie Mercury, lead vocalist of Queen. Through ingenious methods of composition and multitrack recording Queen, featuring Mercury, Brian May and Roger Taylor were able to sound like a large choir.

Illustration # 34

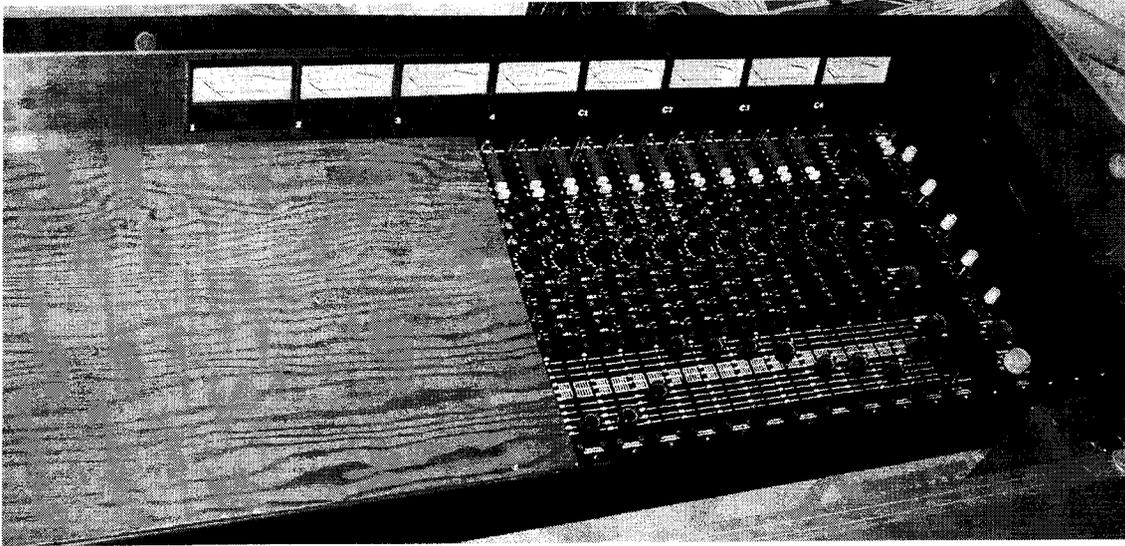


Image by D. Promane

Greg Vintar's 1967 Stevenson console.

Illustration #35



Image by D. Promane

Studor A80 found in Greg Vintar's project studio.

Illustration #36



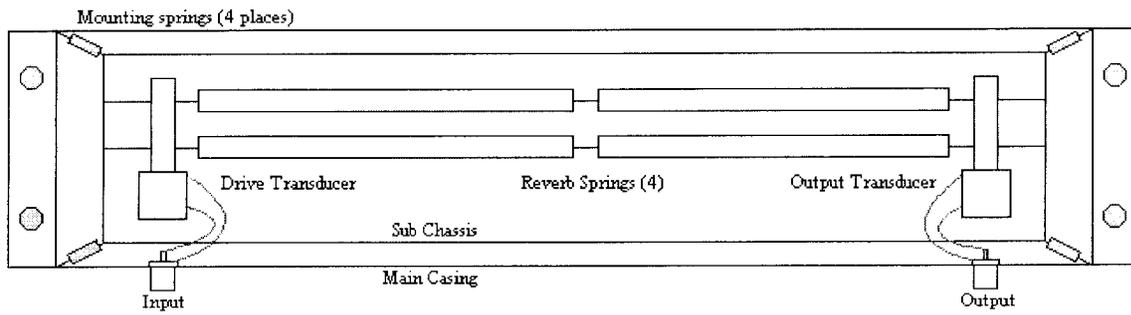
Image by D. Promane

Vintar's 628 MCI Console located in his production room.

Appendix B:

DIAGRAMS AND SCHEMATICS

ILLUSTRATION # 1



Schematic of a spring reverb unit.

ILLUSTRATION #2

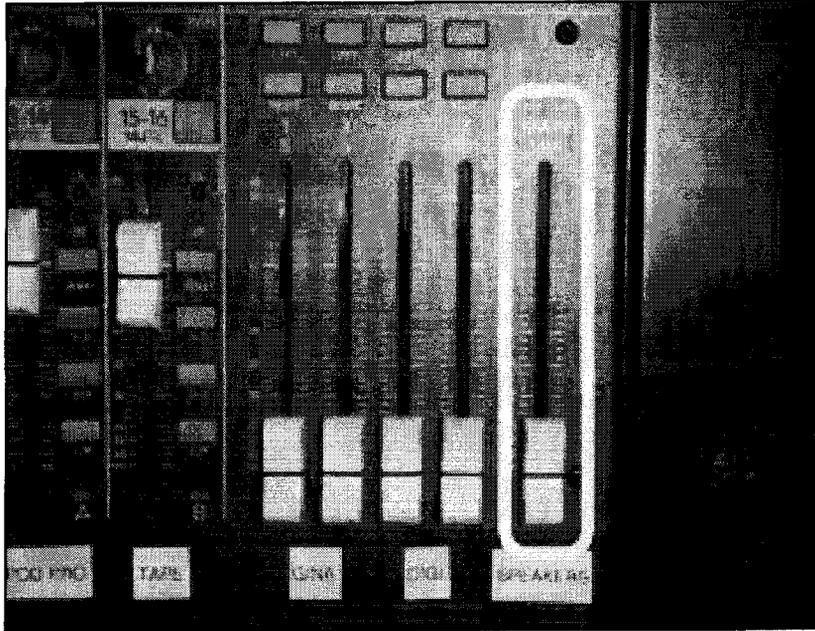


Image courtesy of Torres engineering.

Master volume control illustrated on a recording console.

ILLUSTRATION #3

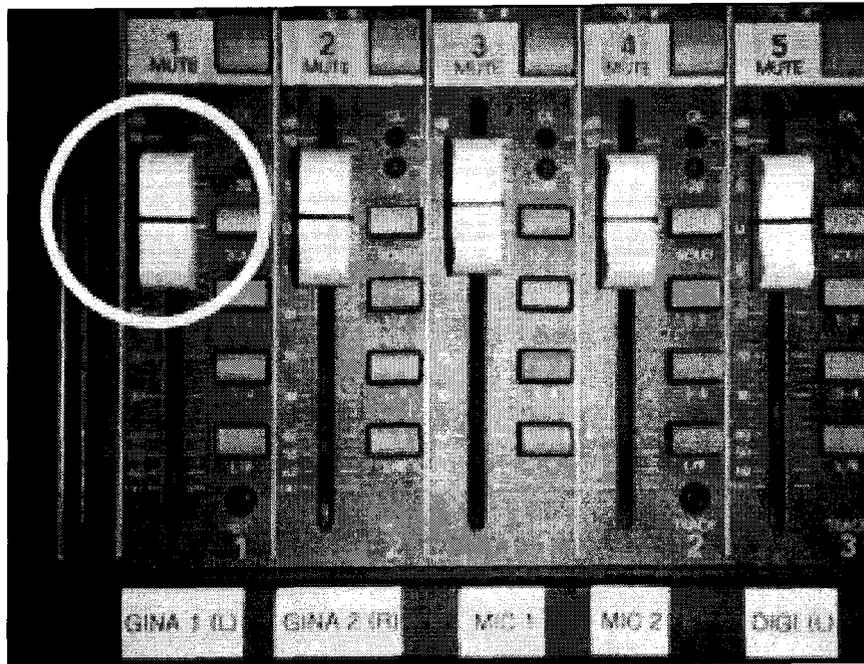


Image courtesy of Torres engineering.

A fader visible on a recording console.

ILLUSTRATION #4

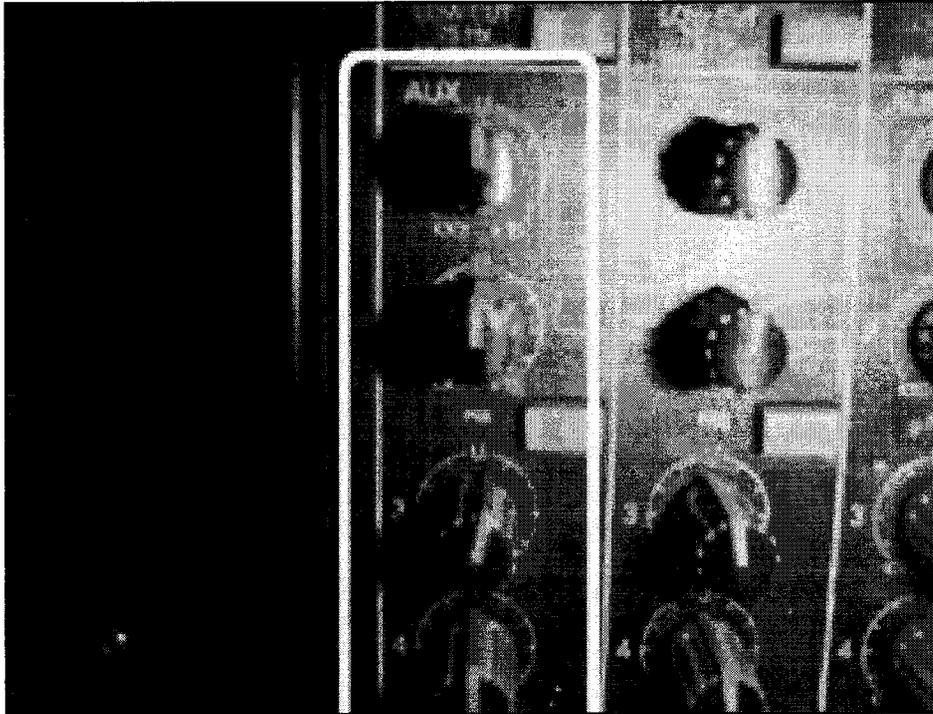


Image courtesy of Torres engineering.

Auxiliary send used to control off board effects unit on the recording console.

ILLUSTRATION #5

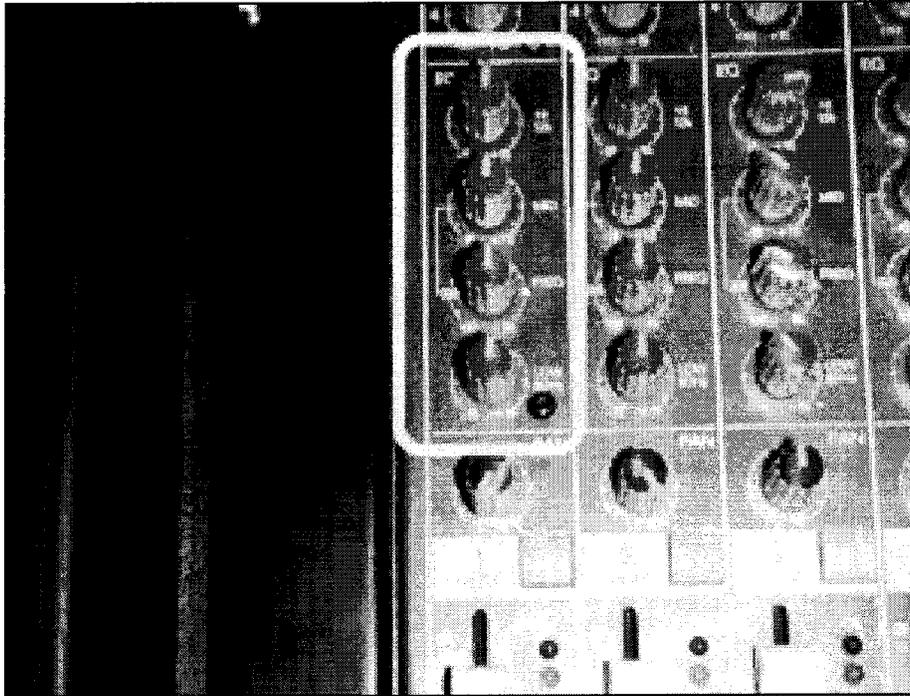


Image courtesy of Torres engineering.

Equalization used to adjust the timbres produced by various instruments.

ILLUSTRATION #6

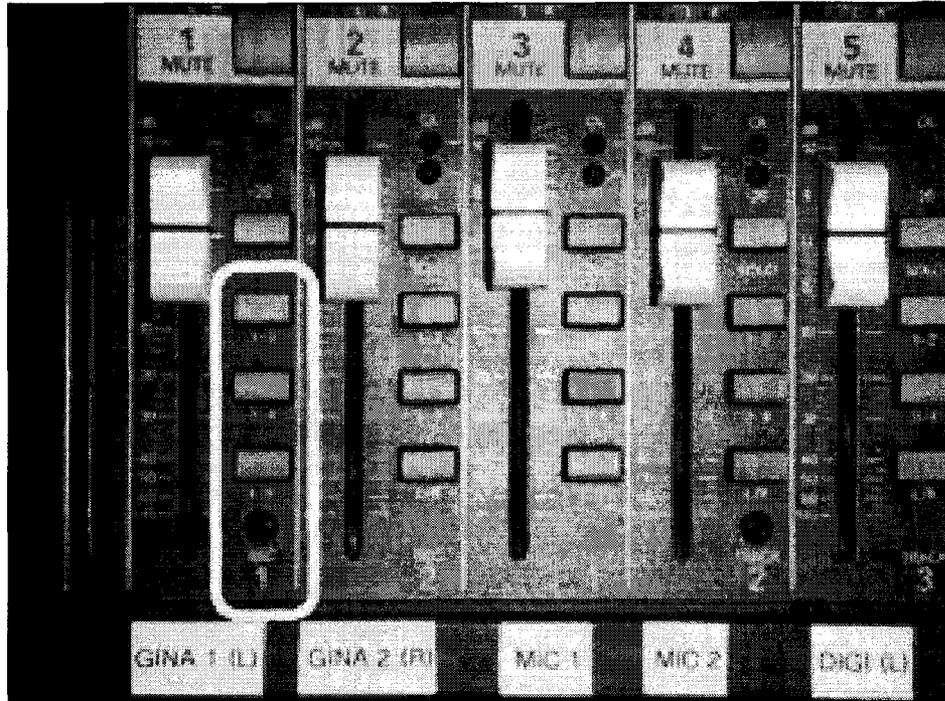


Image courtesy of Torres engineering.

The master send.

ILLUSTRATION #7

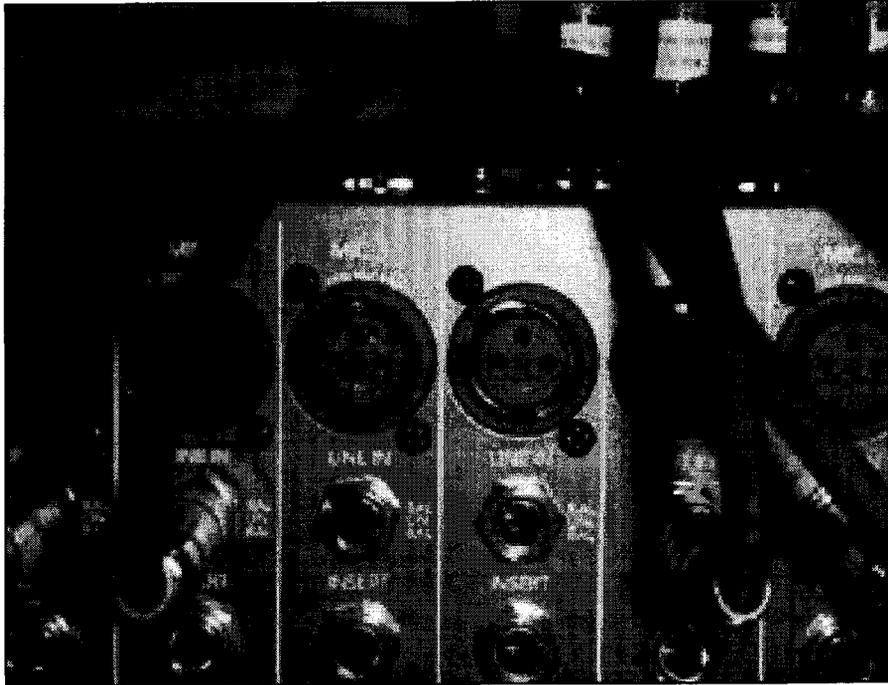
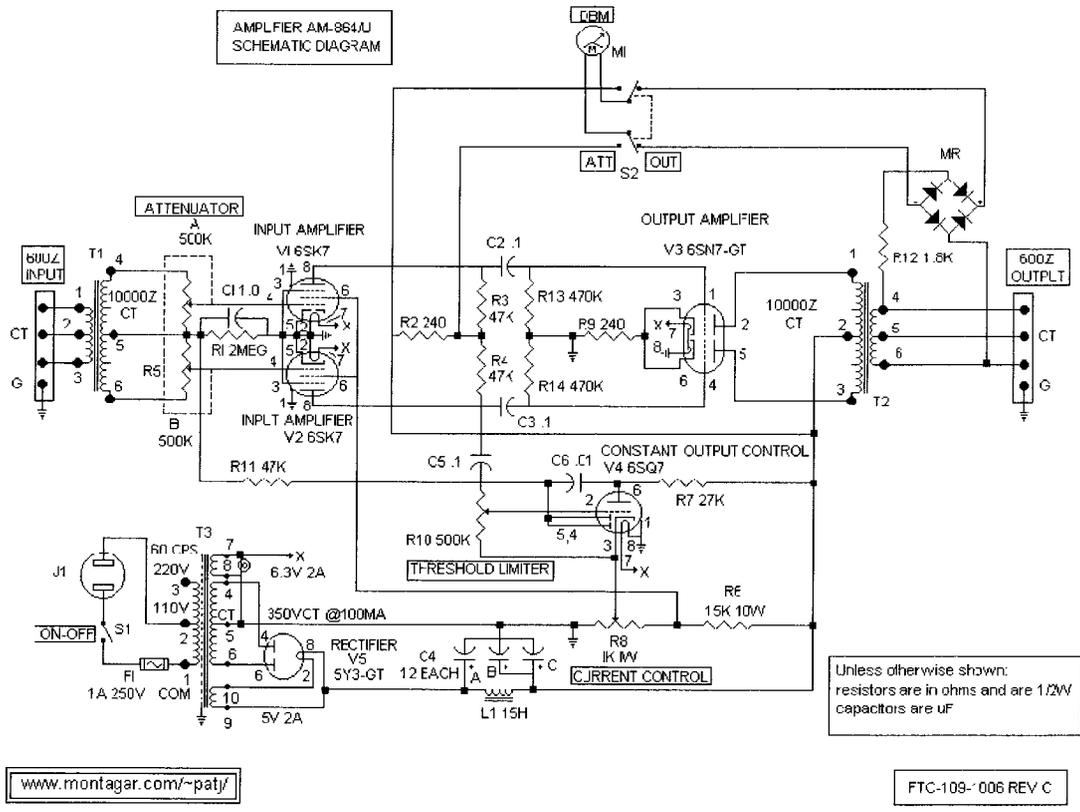


Image courtesy of Torres engineering

Instrument and microphone inputs.

ILLUSTRATION #8



Schematic courtesy of Montagar.com

Schematic of an audio compressor.

Appendix C:

ADDITIONAL RESEARCH ON RECORDING EQUIPMENT AND SOUND EFFECTS

1

DIRECT AND REVERBERANT SOUND FIELDS

A direct and reverberant sound field exists within any given room. An easy method of deciphering whether a projected sound is a direct sound field is to determine if the direct sound (which is the original sound source) is louder than its reflections produced within the room. If the direct sound is louder, you are in a direct field of sound. Contrarily, if the reflected sounds are louder than the direct sound, you are in a reverberant field. There is also a sound point that both the direct and reverberant fields share the same level of intensity labeled the critical distance (Lehman, 1996).

The reverberant field is important because it keeps sound levels high while increasing sound energy. This occurs in sites constructed with hard, dense materials. Natural room reverberation keeps decibel levels high and raises sound pressure. In an outdoor setting, reflective surfaces are minimal in relation to open space, thus sound energy is lost. The reverberant field may be beneficial in musical performance because it helps the listener hear all the instruments as an ensemble. Reverberant fields are most notable in symphonic performances which take place in theatres. Instruments played within small spaces sound differently than when played in large settings due to natural reverberation. The reverberant field in a large room spreads energy creating reverberation and enabling a unity of instruments. In rock music, the direct field of sound has many similarities. Both natural and artificial reverberation can be added to the sound of instruments helping them to blend with one another, yet by blending various timbres, reverberation can have an overpowering effect.

The problem with early artificial reverberation was that an entire ensemble was forced to use an equal amount of reverberation. In modern recording, individual instruments can be given a different degree of reverberation. Some instruments become distorted with the addition of reverberation. Some instruments, such as drums, become distorted when reverberation is placed on cymbals and the bass drum, yet their timbre is greatly enhanced when toms and the snare drums are reverberated. Multitrack recording enabled reverberation to be placed on individual instruments rather than on an entire master mix. Artificial methods of reverberation were created by studio engineers in order to create a controlled studio reverberation.

PLATE REVERBERATION

Plate reverberation (see Appendix A, Illustration #11) required the use of a steel plate, which varied in size from 3 X 3 ft. to as large as 4 X 8 ft. This metal plate was then linked to an audio signaling device. Plate reverberation was fabricated with the use of stainless sheet metal, similar to the steel used in automobile production. The transducers (similar to a speaker cone) were attached to the sheet metal sending an audio signal through the sheet-metal producing a reverberated quality. Dampening plates were placed on the sheet-metal in order to control the desired amount of reverberation.

Using plate reverb in the early stages of sound recording was a lengthy procedure. An entire master track was played on a recording/playback device, which was then played through a reverberation unit on two of the four channels available on the console. The product was then re-

recorded with a microphone capturing the reverberated sound produced by the plates. This method of reverberation was problematic in the rock genre because an equal amount of reverb was placed on each instrument. Studios continued to use this method of reverberation until the advent of multitrack recording, which made reverb assignable to individual tracks. Plate reverberation was the preferred method of artificial reverberation in most Canadian studios, yet due to high fabrication costs it was generally restricted to production studios.

SPRING REVERBERATION

Spring reverb (see Appendix B, Illustration #1) provided an effective medium of reverberation without the cost and bulkiness of plate reverberation. In 1935, Laurens Hammond introduced the Hammond Organ, the first instrument to use spring reverberation. People were familiar with the timbre produced by the church organ, in which sound reverberated due to the dense materials and high ceilings found within churches. Consumers expected to hear the grand reverberated sonorities of a church organ in a home setting, yet homes had sound dampening qualities eliminating all natural reverb. Laurens Hammond knew that in order to make his organs commercially successful he would have to create an artificial form of reverberation. Hammond began experimenting with artificial forms of reverberation and discovered that:

Bell Labs had devised an electromechanical device to simulate a single delay experienced on long distant calls. The device used two springs to transmit the delaying signal and four additional springs to dampen and “center” the driver saddle. While the dampening were housed in long tubes filled with oil, one of the springs transmitting the delay signal ended in a short tube which, by varying the amount of oil in the tube, varied the decay time. After modifying the reverb to create many echoes, it was perfect for Hammond’s needs (Sound Enhancement Products, 2005).

Spring reverberation was first used by Hammond in 1935 and is still used in amplifiers

today. Modern spring reverberation is produced using a spring “enclosed in a metal box, called the reverb pan, which is attached to the bottom of the amp. The pan takes an audio signal, or sound produced by the instrument and produces a reverberated version which is then mixed into the dry signal” (Lehman, 1996). Spring reverb functions on a similar principle as plate reverb because they both have an audio signal attached to one end of a transducer permitting electrical and mechanical energy. Engineers often used more than one spring in order to create a randomness of echoes thus creating a more natural effect.

OTHER FORMS OF REVERB

Another early form of reverberation is tank reverb, which uses an oil filled tank to produce a reverberated sonority. Reverb is produced by sound being transmitted into a tank and deflected off of its inner walls. The degree of reverberation is adjustable by the amount of oil used within the tank. An empty tank produces more sound reflections, thus creating a more reverberated sound, while a full tank produces a less reverberated effect. This method of reverberation was not commonly used, although small project studio owners who could not afford plate reverb units would often experiment with tank reverb.

Project studios that did not have the budget to invest in artificial means of reverberation, would often record in naturally reverberant settings. Engineers would take their final mix to a well reverberated structure such as a church, and play their master mix through a set of loud speakers. Microphones were placed in appropriate locations throughout the church in order to re-record the final mix capturing the room’s natural reverberation. This method was effective, yet

had its limitations; the room was not controllable, therefore the engineer was unable to dampen the degree of reverb produced throughout the room. Studio personnel also had difficulty transporting recording equipment to out of studio locations.

2

Audio compressors

Audio compressors are used to level or regulate the dynamics of an audio source. A compressor amplifies an audio signal and then applies dynamic control (or compression) to the audio signal in order to maintain a higher decibel level while maintaining a clarity of timbre. The compressor is used to level off all of the recorded frequencies. Therefore, all of the low signals sent to the compressor will be elevated, while the high signals will be lowered, creating a dynamically controlled product. Universal Audio was one of the leading companies in the establishment of audio compressors. Universal Audio describes an audio compressor as

a device in which the gain of a circuit is automatically adjusted using a predetermined ratio that acts in response to the input signal level. A compressor/limiter "rides gain" like a recording engineer does by hand with the fader of a console: it keeps the volume up during softer sections and brings it down when the signal gets louder. The dynamic processing that occurs at ratios below 10 or 12 to 1 is generally referred to as compression; above that it's known as limiting (Universal Audio, 2005).

Compression was developed in the 1950s when engineers demanded higher decibel levels and volume consistency. The compressor was initially introduced as a leveling amplifier in order to raise the levels of low frequencies and to lower high problematic levels. Fairchild, which later became Universal Audio, was one of the first companies to produce a studio compressor. One of their earliest models labeled the Fairchild 670 (see Appendix A, Illustration #14), was one of the

most revolutionary pieces of studio equipment ever made. Sherman Fairchild, was the son of American Congressman, George Winthrop Fairchild, one of the founders of the IBM computer corporation. Sherman Fairchild was constantly designing modern electronic equipment and was the first to produce aerial photography equipment during WWI. This led to the development of an aerial camera corporation and later Fairchild Recording Equipment.

The Fairchild 670 uses a single push-pull stage of amplification with high voltage control. This unit is a variable tube limiter, which is unique because it uses tubes for gain reduction and not only for amplification. The audio path used in the 670 is quite simple; compression occurs directly in the audio path rather than sending out a signal to a separate compression circuit. This unit is considered the “Holy Grail” of compressors in studio equipment due to its current price of \$30,000 U.S. This unit is now considered rare and difficult to maintain, due to the lack of replacement parts. The 670 was built using fourteen transformers and twenty vacuum tubes, while occupying six spaces in the average rack and weighing sixty-five pounds. This unit was primarily used by mastering houses in order to increase the output generated by the final master mixes from studios. Other companies, including Universal Audio, began producing compressors throughout the 1960s.

As mentioned above, there are two methods used to maintain dynamic control: compression and limiting. The limiter was essentially a component of the Fairchild 670, although it was not until the 1970s with the advent of the UREI 1176 that limiters began to be sold separately from compressors. Limiters work on the same principles as compressors, although they have less variables. The limiter creates a maximum ceiling, which sets a limit on how high the

output signal can go. If the signal is driven beyond the set limit of the limiter, it will remain at the ceiling level. These devices were primarily found in mastering houses and sometimes used in live productions. This unit was particularly useful for drum kits in order to limit the kick drum, which required a consistent level.

Throughout the 1960s and '70s and prior to the advent of solid state technology, both compressors and limiters were tube driven. Companies such as SSL (Solid State Logic) and dbx were major producers of compressors in the 1980s and '90s. Tube compressors, such as the Fairchild and LA-2A, are the most popular and sought after compressors/limiters. Both the Fairchild and the LA-2A were expensive, equal in value to an average automobile.

PRIMARY SOURCES

Abbott, Caleb. Drummer, Turning Into Salt. 2005. Interviewed by author, October 14 and November 23, Ottawa. Email communication.

Chenier, Dax, Timmins musician. 2006. Interviewed by author, January 2006, personal interviews.

Emberson, Lisa, music division, Library and Archives Canada. 2005. Interviewed by author, January 2005-April 2005, Ottawa. Email communications.

Grenville, Dean, bassist from Turning Into Salt. 2005. Interviewed by author, October 14 and November 23, Ottawa. Tape recording.

Heard, Jonathan, tour manager and technician for Promane. 2005. Interviewed by author, January 2005- December 2005, personal interviews, Timmins, ON. January 2005-December 2005, telephone conversations, Timmins, Ottawa, ON. January 2005-December 2005, email communications.

Hamilton, Adam, drummer, Signal Threat. 2006. Interviewed by author, March 23, Hamilton, ON.

Jardin, Robert, Stratford Music Festival sound technician and sound engineer. 2005. Interview by author, September 2005- January 2005, Thunder Bay. Telephone conversations.

Kelley, Russell, head of the music division, Canada Council. 2005. Interviewed by author, February 2, Ottawa.

MacArthur, Stuart, April Wine sound tech. 2005. Interview by author, October 5, Ottawa.

Mongeon, James, owner of Sound Wise Musical Productions, and sound engineer. 2005. Interviewed by author, January 2005- December 2005, personal interviews, Timmins, ON. January 2005- December 2005, telephone conversations, Timmins, Ottawa, ON. January 2005- December 2005, email communications.

Promane, Barry, Ph.D. candidate, University of Western Ontario. 2005-2006. Interviewed by author, September 2005- January 2006, personal interviews, London, Timmins, Ottawa, ON. September 2005- January 2006, telephone conversations, Ottawa, London. September 2005- January 2006, email communications.

Savard, Rick, Timmins project studio owner. 2006. Interviewed by author, January 2006, personal interviews.

Shultz, Ken, April Wine sound tech and tour manager. 2005. Interviewed by author, September

2005, personal interviews.

Vintar, Greg, Stratford Festival technician, Fender Custom Shop, Producer and engineer. 2006. Interviewed by author, January 2005- April 2006, personal interviews, Timmins, ON. January 2005- December 2005, telephone conversations, Ottawa, Timmins, ON.

SECONDARY SOURCES

Alberts, Randy. 2003. *Tascam: 30 Years of Recording Evolution*. New York: Hal Leonard.

Belleville, Nyree. 2004. *Booking, Promoting and Marketing Your Music: A Complete Guide for Bands and Solo Artists*. Auburn Hill: Mixbooks.

Bennett, Andrew. 1997. Going down the pub!: The pub rock scene as a resource for the consumption of popular music. *Popular Music*, 16/1: 97-108.

Bogdanov, Vladimir and Woodstra, Chris and Erlewine, Stephen, ed. 2003. *All Music Guide to Hip-Hop: The Definitive Guide to Rap and Hip-Hop*. San Francisco: Backbeat Books.

Chaumel, G. 1989. Music, A Cry From the Heart. *Rencontre*, Vol. 11, No. 1. 12-13.

Cowen, Tyler. 1998. *In Praise of Commercial Culture*. Cambridge: Harvard University Press.

Daniel, Eric D. and Mee, Denic C. and Clark, Mark H, ed. 1998. *Magnetic Recording: The First 100 Years*. Piscataway: IEEE Press.

Diamond, Beverley. 2001. "Northern Canada Popular Music." In *Garland Encyclopedia of World Music*, 3: 1279-81. New York: Garland.

Einarson, John. 1995. *American Woman: The Story of the Guess Who*. Kingston: Quarry Press.

Elrifi, Ivor. 1988. What's DAT - Amstrad revisited: Canadian Copyright Law and digital audio tape players. *Canadian Business and Law Journal*, (Dec): vol 14.

Gasher, Mike and Lorimer, Rowland. 2001. *Mass Communication in Canada*. New York: Oxford University Press.

Gould, Glenn. 1966. The prospects of recording. *High Fidelity*, (April): vol 16. 43-66.

Greenwald, Ted. 1992. *The Musician's Home Recording Handbook: Practical Techniques for Recording Great Music at Home*. San Francisco: Backbeat Books.

Huber, David Miles and Runstein, Robert E. 1997. *Modern Recording Techniques*. Burlington:

Focal Press.

- Jackson, Laura. 1996. *Mercury: The King of Queen*. London: Smith Gryphon Limited.
- Jackson, Rick. 1994. *Encyclopedia of Canadian rock pop & folk music*. Kingston: Quarry Press.
- Keillor, Elaine. 2002. *Vignettes on Music in Canada*. Ottawa: CMHS.
- Marco, Guy A. 1993. *Encyclopedia of Recorded Sound in the United States*. New York: Garland.
- Melhuish, Martin. 1983. *Heart of Gold: 30 Years of Canadian Popular Music*. Toronto: CBC Enterprises.
- Milstead, Ben. 2003. *Home Recording Power*. Boston: Muska & Lipman Publishing.
- Moogk, Edward B. 1975. *Roll back the years: history of Canadian recorded sound and its legacy ; genesis to 1930*. Ottawa: National Library of Canada.
- Moore, Sarah Janette. 2002. *Re-Articulating Canadian Popular Music Through a Local Lens: Examining "The Great Big Sea" and Issues of Locality, Regionism and Nationalism*. M.A. thesis, Carleton University, Ottawa.
- Morton, David. 2000. *Off the Record*. New Jersey: Rutgers University Press.
- Newton, Jon. 2006. "Ongoing Battles with Big Music." *News Tech World*. (9 April): n.p.
- Nicholls, Geoff. 1997. *The Drum Book: A History of the Rock Drum Kit*. London: Backbeat Books.
- Ottawa Citizen*. 1878. 16 May: 4.
- Rothenberg, David. 1995. *Wild Ideas*. Minnesota: University of Minnesota Press.
- Rudolf, Thomas and Leonard, Vincent Jr. 2001. *Recording in the Digital World: Complete Guide to Studio Gear and Software*. Boston: Berklee Press.
- Schafer, D. Paul. 1988. *The Character of Canadian Culture*. Markam: World Culture Project.
- Shuker, Roy, ed. 2002. *Popular Music: The Key Concepts*. New York: Routledge.
- Starr, Lawrence and Waterman, Christopher. 2003. *American Popular Music: From Minstrelsy to MTV*. New York: Oxford University Press.
- Stim, Richard. 2004. *Music Law: How to Run Your Band's Business*. Berkley: Delta Printing.

Théberge, Paul. 1989. *The sound of music: technological rationalization and the production of popular music*. *New Formations*, (Summer): vol 8. 99-111.

Théberge, Paul. 1997. *Any Sound You Can Imagine*. Hanover: University of New England Press.

Wagner, Vit. 2006. "I've Done a Few Good Things." *Toronto Star*. (1 April): n.p.

Wallis, Roger and Malm, Krister. 1984. *Big Sounds From Small Peoples: The Music Industry in Small Countries*. New York: Pendragon.

Yorke, Ritchie. 1971. *Axes, Chops and Hot Licks: The Canadian Rock Music Scene*. Edmonton: Hurtig.

ELECTRONIC AND MEDIA RESOURCES

604 Records. 2006. (604records.com). Accessed 29 April, 2006.

A Brief History of the Vinyl Record. 2006.

(<http://72.14.207.104/search?q=cache:oXxPPRw4F0AJ:www.geocities.com/flangehead2/intro/RecordHistory.html+the+LP+record+history+1958&hl=en&gl=ca&ct=clnk&cd=2>). Accessed 12 March, 2006.

A History of Sound Recording Technology. 2005. (www.recording-history.org). Accessed 19 April, 2005.

Alesis. 2005. (<http://www.alesis.com/index.php?id=8,2,0,0,1,0>). Accessed 10 December, 2005.

David Sarnoff Collection. 2002. (<http://www.davidsarnoff.org/vtm-appendix01.html>). Accessed 10 March, 2006.

Flohil, Richard. 2001. *Recorded Sound Technology And Its Impact*. Encyclopedia of Music in Canada.

(<http://thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=U1ARTU0002937>). Accessed 9 January, 2006.

From The Free On-line Dictionary of Computing (FOLDOC). 2005. (<http://www.foldoc.org/>). Accessed 2 January, 2006.

George Massenburg Labs. 2005.

(http://www.massenburg.com/cgi-bin/ml/parametric_invention.html?id=Jc4Uit3b). Accessed 12 January, 2006.

Greenhouse Studios. 2006. (www.greenhousestudios.com) Accessed 27 April, 2006.

- How stuff works. 2006. *In The Beginning: Etchin Tin*.
(<http://electronics.howstuffworks.com/analog-digital1.htm>) Accessed 8 March, 2006.
- Indie Pool. 2006. (<http://www.indiepool.com/comments/satellite.asp>). Accessed April 20, 2006.
- Inventors. 2006. *Sound Recording History*.
(<http://inventors.about.com/library/inventors/blsoundrecording.htm>). Accessed March 13, 2006.
- Krewen, Nick. 2006. *A Guide To Music Publishing, Part Two: The Times They Are A'Changing*.
(http://www.socan.ca/jsp/en/word_music/PubGuide04.jsp). Accessed 20 April, 2006.
- LeCaine, Hugh. 1999. *Compositions Demonstrations (1946-1974)*. JWD03. JWD Music.
- Lehman, Scott. 1996. *Effects Explained: Reverb*.
(<http://www.harmony-central.com/Effects/Articles/Reverb/>). Accessed 12 January, 2006.
- Liebrand Audio Images. 2005. (<http://www.liebrand.nl/>). Accessed 10 April, 2005.
- Love, Courtney. 2000. *Courtney Hollywood Online Entertainment Conference To The Digital Love*, (http://www.cdbaby.net/articles/courtney_love.html). Accessed 10 April, 2006.
- McNamee, Gregory. 2006. *Review: Off The Record*.
(<http://www.amazon.com/gp/product/0813527473/103-5445697-7470219?v=glance&n=283155>). Accessed 25 April, 2006.
- Metalworks Studios. 2006. (www.metalworksstudios.com). Accessed 29 April, 2006.
- Moogk, Edward. 2006. *Berliner Gramophone Company*. Encyclopedia of Music in Canada.
(<http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=U1ARTU0000287>). Accessed 9 March, 2006.
- Moroz, Ross. 2006. *Music Notes*. The Vue Weekly: Edmonton's 100% Independent News and Entertainment Weekly. (<http://www.vueweekly.com/articles/default.aspx?i=2971>). Accessed 17 April, 2006.
- National Research Council of Canada. 2006. *Portrait of a Scientist/Musician*.
(http://www.ewh.ieee.org/reg/7/millennium/electronic_music/em_lecaine.html). Accessed 25 April, 2006).
- Nygaard King, Betty. 2006. *Burton Cummings*. Encyclopedia of Music in Canada.
(<http://www.collectionscanada.ca/emc/m17-119.01-e.php?uid=868&uidc=ID>). Accessed 29 April, 2006).

- P2Pnet. 2006. *The Tragically Hip's Money Troubles*.
(<http://72.14.203.104/search?q=cache:YDxxf02qThwJ:p2pnet.net/story/1434+canadian+artists+on+file+sharing+tragically&hl=en&gl=ca&ct=clnk&cd=1>). Accessed 20 April, 2006.
- Pepin, Daniel, R. 1998. *The Technology of Stereophonic Recording*.
(http://web.bryant.edu/~ehu/h364proj/fall_98/pepin/index.htm). Accessed 12 March, 2006.
- Paul, Les. 1947. *Lover*. Capital Records.
- Plastic. 2006. *Canadian Rock Invasion Possible? Or Will It Be Stopped At The Border?*
(<http://www.plastic.com/article.html;sid=04/07/07/17004492>). Accessed 25 April, 2006.
- Schoenherr, Steven E. 1999. (<http://history.acusd.edu/gen/recording/bell-labs.html>). Accessed 12 April, 2005.
- Songfacts. 2006. *American Woman*.
(http://72.14.207.104/search?q=cache:ID_UarcNxnYJ:www.songfacts.com/detail.php%3Fid%3D446+the+lyrics+for+american+woman+were+inspired+by&hl=en&gl=ca&ct=clnk&cd=1). Accessed 24 April, 2006.
- Soundcraft. 2005. (<http://www.soundcraft.com/about.asp>). Accessed 9 January, 2006.
- Sound Enhancement Products. 2005. *The History of Spring Reverberation*.
(<http://www.accutronicsreverb.com/history.htm>). Accessed 9 January, 2006.
- Soylent Communications. 2005. (<http://www.nndb.com/people/718/000022652/>). Accessed 12 April, 2005.
- Tascam. 2006. (<http://tascam.com/Company.html>). Accessed 12 January, 2006.
- Theberge, Paul. 2001. *Recorded Sound And Its Impact*. Encyclopedia of Music in Canada. ID: 2973. (<http://www.collectionscanada.ca/emc/m17-119.01-e.php?uid=2973&uidc=ID>). Accessed 19 April, 2005.
- Thompson Memorial Gallery. 2006. (<http://www.tomthomson.org/groupseven/index.html>). Accessed 26 April, 2006.
- Universal Audio. 2005. (<http://www.uaudio.com/company/index.html>). Accessed 23 November, 2005.

Young, Gayle and Ford, Clifford. 2005. Encyclopedia of Music in Canada. (<http://www.collectionscanada.ca/emc/m17-119.01-e.php?uid=6467&uidc=ID>). Accessed on 12 April, 2005.

ALSO CONSULTED

Barthes, Roland. 1977. The Grain of the Voice. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 293-301. New York: Pantheon Books.

Bayton, Mavis. 1988. How Women Become Musicians. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 238-57. New York: Pantheon Books.

Bennett, H. Stith. 1980. The Realities of Practice. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 221-237. New York: Pantheon Books.

Berland, Jody. 1993. Sound, Image and Social Space: Music Video and Media Reconstruction. In *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 25-57. London and New York: Routledge.

Björnberg, Alf. 1993. Teach you to rock? Popular music in the university music department. *Popular Music*, 12/1: 69-77.

Björnberg, Alf. 1994. Structural relationships of music and images in music video. *Popular Music*, 13/2: 51-74.

Booth, Mark W. 1981. Jingle: Pepsi-Cola Hits the Spot. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 320-25. New York: Pantheon Books.

Brackett, David. 1994. The Politics and Practice of 'Crossover' in American Popular Music, 1963 to 1965. *Musical Quarterly*, 78/4: 774-97.

Bradby, Barbara. 1993. Sampling sexuality: gender, technology and the body in dance music. *Popular Music*, 12/2: 155-76.

Bradley, Dick. 1992. *Understanding Rock 'n' Roll: Popular Music in Britain 1955-1964*. Buckingham: Open University Press.

Brooks, William. 1982. On being tasteless. *Popular Music*, 2: 9-18.

Buxton, David. 1983. Rock Music, the Star System, and the Rise of Consumerism. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 427-40. New York: Pantheon Books.

- Carson, Tom. 1979. Rocket to Russia. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 441-49. New York: Pantheon Books.
- Chester, Andrew. 1970. Second Thoughts on a Rock Aesthetic: The Band. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 315-19. New York: Pantheon Books.
- Clarke, Gary. 1981. Defending Ski-Jumpers: A Critique of Theories of Youth Subcultures. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 81-96. New York: Pantheon Books.
- Clarke, Paul. 1983. A magic science: rock music as a recording art. *Popular Music*, 3: 195-213.
- Cohen, Sara. 1993. Ethnography and popular music studies. *Popular Music*, 12/2: 123-38.
- Cook, Nicholas. 1994. Music and meaning in the commercials. *Popular Music*, 13/1: 27-40.
- Cutler, Chris. 1984. Technology, politics and contemporary music: necessity and choice in musical forms. *Popular Music*, 4: 279-300.
- Dimitriadis, Greg. 1996. Hip hop: from live performance to mediated narrative. *Popular Music*, 15/2: 179-94.
- Durant, Alan. 1985. Rock revolution or time-no-changes: visions of change and continuity in rock music. *Popular Music*, 5: 97-21.
- Fornäs, Johan. 1995. The future of rock: discourses that struggle to define a genre. *Popular Music*, 14/1: 111-25.
- Frith, Simon. 1981. The magic that can set you free: the ideology of folk and the myth of the rock community. *Popular Music*, 1: 159-68.
- Frith, Simon. 1985. Afterthoughts. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 419-24. New York: Pantheon Books.
- Frith, Simon. 1986. Art versus technology: The strange case of popular music. *Media, Culture & Society*, 8: 263-79.
- Frith, Simon. 1993. Youth/Music/Television. In *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 67-83. London and New York: Routledge.
- Gaar, Gillian G. 1992. *She's a Rebel: The History of Women in Rock & Roll*. Seattle: Seal Press.
- Garofalo, Reebee. 1986. How autonomous is relative: popular music, the social formation and

cultural struggle. *Popular Music*, 6/1: 77-92.

Garratt, Sheryl. 1984. Teenage Dreams. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 399-409. New York: Pantheon Books.

Geyrhalter, Thomas. 1996. Effeminacy, camp and sexual subversion in rock: The Cure and Suede. *Popular Music*, 15/2: 217-24.

Goodwin, Andrew. 1988. Sample and Hold: Pop Music in the Digital Age of Reproduction. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 258-73. New York: Pantheon Books.

Goodwin, Andrew. 1993. Fatal Distractions: MTV Meets Postmodern Theory. In *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 45-66. London and New York: Routledge.

Grossberg, Lawrence. 1984. Another boring day in paradise: rock and roll and the empowerment of everyday life. *Popular Music*, 4: 225-58.

Grossberg, Lawrence. 1986. Is There Rock After Punk? In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 111-23. New York: Pantheon Books.

Grossberg, Lawrence. 1993. The Media Economy of Rock Culture: Cinema, Post-Modernity and Authenticity. *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 185-209. London and New York: Routledge.

Hamm, Charles. 1981. The fourth audience. *Popular Music*, 1: 123-41.

Hawkins, Stan. 1996. Perspectives in popular musicology: music, Lennox, and meaning in 1990s pop. *Popular Music*, 15/1: 17-36.

Hebdige, Dick. 1979. Style as Homology and Signifying Practice. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 56-65. New York: Pantheon Books.

Hebdige, Dick. 1979. *Subculture: The Meaning of Style*. New York: Routledge.

Hisama, Ellie M. 1993. Postcolonialism on the make: the music of John Mellencamp, David Bowie and John Zorn. *Popular Music*, 12/2: 91-104.

Hosokawa, Shuhei. 1984. The walkman effect. *Popular Music*, 4: 165-80.

Hurley, Jennifer M. 1994. Debate: Music video and the construction of gendered subjectivity (or how being a music video junkie turned me into a feminist). *Popular Music*, 13/3: 327-38.

- Kealy, Edward R. 1979. From Craft to Art: The Case of Sound Mixers and Popular Music. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 207-20. New York: Pantheon Books.
- Keightley, Keir. 1996. Turn it down! she shrieked: gender, domestic space, and high fidelity, 1948-59. *Popular Music*, 15/2: 149-77.
- Kruse, Holly. 1993. Subcultural identity in alternative music culture. *Popular Music*, 12/1: 33-41.
- Laing, Dave. 1971. Listen to Me. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 326-40. New York: Pantheon Books.
- Lee, Stephen. 1995. Re-examining the concept of the 'independent' record company: the case of Wax Trax! records. *Popular Music*, 14/1: 13-31.
- Lewis, Lisa. 1990. *Gender Politics and MTV: Voicing the Difference*. Philadelphia: Temple University Press.
- Lilliestam, Lars. 1996. On playing by ear. *Popular Music*, 15/2: 195-216.
- Manuel, Peter. 1995. Music as symbol, music as simulacrum: postmodern, pre-modern, and modern aesthetics in subcultural popular musics. *Popular Music*, 14/2: 227-39.
- McClary, Susan and Robert Walser. 1988. Start Making Sense! Musicology Wrestles with Rock. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 277-92. New York: Pantheon Books.
- McRobbie, Angela. 1980. Settling Accounts with Subcultures: A Feminist Critique. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 66-80. New York: Pantheon Books.
- Middleton, Richard. 1983. Play it again Sam: Some notes on the productivity of repetition in popular music. *Popular Music*, 3: 235-70.
- Middleton, Richard. 1985. Articulating musical meaning/re-constructing musical history/locating the 'popular'. *Popular Music*, 5: 5-43.
- Middleton, Richard. 1993. In *Popular music analysis and musicology: bridging the gap*. *Popular Music*, 12/2: 177-90.
- Negus, Keith. 1993. Plugging and programming: pop radio and record promotion in Britain and the United States. *Popular Music*, 12/1: 57-68.
- Negus, Keith. 1999. *Music Genres and Corporate Cultures*. London: Routledge.

- O'Brien, Lucy. 1995. *She Bop: The Definitive History of Women in Rock, Pop and Soul*. London: Penguin Books.
- Paddison, Max. 1983. The critique criticised: Adorno and popular music. *Popular Music*, 3: 201-18.
- Potter, John. 1994. The singer, not the song: women singers as composer-poets. *Popular Music*, 13/2: 191-99.
- Pratt, Ray. 1990. *Rhythm and Resistance: Explorations in the Political Uses of Popular Music*. London: Praeger.
- Reynolds, Simon and Joy Press. 1995. *The Sex Revolts: Gender, Rebellion and Rock n' Roll*. London: Serpent's Tail.
- Riley, Tim. 1987. For the Beatles: notes on their achievement. *Popular Music*, 6/3: 257-71.
- Rösing, Helmut. 1984. Listening behaviour and musical preferences in the age of 'transmitted music'. *Popular Music*, 4: 119-49.
- Savan, Leslie. 1993. Commercials Go Rock. In *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 85-90. London and New York: Routledge.
- Schwartz, Jeff. 1993. Writing Jimi: rock pedagogy as postmodern folkloric practice. *Popular Music*, 12/3: 281-88.
- Shepherd, John. 1983. A theoretical model for the sociomusicological analysis of popular musics. *Popular Music*, 3: 145-77.
- Shepherd, John. 1994. Music, culture and interdisciplinarity: reflections on relationships. *Popular Music*, 13/2: 127-41.
- Stefani, Gino. 1986. Melody: A Popular Perspective. *Popular Music*, 6/1: 21-35.
- Steward, Sue and Sheryl Garratt. 1984. *Signed, Sealed and Delivered: True Life Stories of Women in Pop*. London: Pluto Press.
- Stilwell, Robynn. 1995. In the Air Tonight: Text, Intertextuality, and the Creation of Meaning. *Popular Music and Society*, 19/4: 67-103.
- Stratton, Jon. 1983. Capitalism and Romantic ideology in the record business. *Popular Music*, 3: 143-56.
- Straw, Will. 1983. Characterizing Rock Music Culture: The Case of Heavy Metal. In *On*

- Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 97-110. New York: Pantheon Books, 1990.
- Straw, Will. 1993. Popular Music and Postmodernism in the 1980s. In *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 3-21. London and New York: Routledge.
- Street, John. 1993. Local differences? popular music and the local state. *Popular Music*, 12/1: 43-55.
- Stringer, Julian. 1992. The Smiths: Repressed (but remarkably dressed). *Popular Music*, 11/1: 15-26.
- Sullivan, Henry W. 1987. Paul, John and Broad Street. *Popular Music*, 6/3: 327-38.
- Symes, Colin. 1997. Beating up the classics: aspects of a compact discourse. *Popular Music*, 16/1: 81-95.
- Tagg, Philip. 1982. Analysing popular music: theory, method and practice. *Popular Music*, 2: 37-67.
- Tagg, Philip. 1994. Debate: From refrain to rave: the decline of figure and the rise of ground. *Popular Music*, 13/2: 209-22.
- Ullestad, Neal. 1986. Rock and rebellion: subversive effects of Live Aid and 'Sun City'. *Popular Music*, 6/1: 67-76.
- Van der Merwe, Peter. 1989. *Origins of the Popular Style: The Antecedents of Twentieth-Century Popular Music*. Oxford: Clarendon Press.
- Walser, Robert. 1992. Eruptions: heavy metal appropriations of classical virtuosity. *Popular Music*, 11/3: 263-308.
- Walser, Robert. 1993a. Forging Masculinity: Heavy-Metal Sounds and Images of Gender. In *Sound & Vision: The Music Video Reader*, ed. Simon Frith, Andrew Goodwin, and Lawrence Grossberg, 153-81. London and New York: Routledge.
- Walser, Robert. 1993b. *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music*. Hanover, NH: Wesleyan University Press.
- Wicke, Peter. 1983. Rock music: a musical-aesthetic study. *Popular Music*, 3: 219-43.
- Willis, Paul. 1978. The Golden Age. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 43-55. New York: Pantheon Books.

Winkler, Peter. 1987. Randy Newman's Americana. *Popular Music*, 7/1: 1-26.

Wise, Sue. 1984. Sexing Elvis. In *On Record: Rock, Pop, and the Written Word*, ed. Simon Frith and Andrew Goodwin, 390-98. New York: Pantheon Books.