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Constructing Musical Spaces Beyond Technological Eden:

A Participative Initiative for Musical Interface Development Based in the Peruvian Context

A Thesis submitted in partial satisfaction of the

requirements for the degree of Master of Arts

in

Music

by

Jose Ignacio Lopez Ramirez-Gaston

Committee in charge

Professor Miller Puckette, Chair
Professor Shlomo Dubnov
Professor David Borgo

2008

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Chair

University of California, San Diego

2008

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ABSTRACT OF THE THESIS

Constructing Musical Spaces Beyond Technological Eden:

A Participative Initiative for Musical Interface Development Based in the Peruvian Context

by

Jose Ignacio Lopez Ramirez-Gaston

Master of Arts in Music

University of California, San Diego, 2008

Professor Miller Puckette, Chair

The work I present here explores the situation of the technology-based musical worlds of Latin America. Focusing on the electronic experimental popular music scene of Peru, it adds to post-Colonial contemporary research by presenting the voice of an unrepresented community to the academic world of "music and technology". I discuss

the need for implementing a democratizing of the access to information by allowing the inclusion of, in this case, Peruvian intelligence in the selection and design of interfaces to be used by the members of the Peruvian scene. In order for a community to operate it has to exist first. For this reason an important part of this work is dedicated to presenting a history of the community studied. The influence of the political and social crisis that has characterized most of the contemporary history of Peru and its effect on this community is also explored and used to inform a process of material selection for interface design. I made a case for a closer look at the relationship between musical territories and their interfaces as two equally important parts of the "message". Interfaces as extensions of the human body carry political, social, and cultural statement that I wish to acknowledge and if possible decipher.

Chapter 1

Introduction

1.1 Mapping a Territory: the Politics of Knowledge

This work follows my interest, both academic and personal, in a particular musical world: the electronic experimental popular music scene of Peru. It is an exploration on how this musical 'territory' can make use of cultural strategies that it can call its own for the appropriation and application of foreign technology. Further more: it explores how these strategies can help in the generation of useful tools for alternatives artistic outputs. I will argue through the paper for the participation of Latin-American knowledge in both the conceptualization and the construction of the 'tools of the trade' needed by the community studied.

First, in this introduction I will present general issues related to my personal motivation, my participation in the research, the methodological framework that informs my work, and the definitions and general arguments that can be helpful to understand its line of though. The second part will present the particular example I will focus on: the electronic experimental popular music scene of Peru and its members. This community exists, for the most part, outside of the cultural and academic institutions, and thus lacks a formal definition. Even though the musical projects I will talk about do not operate as a unified community, they are intimately connected by a similar 'language of technology', by the small size of the electronic music community in

Peru that produces constant interaction between the representatives of different genres, and by their membership in a wide academic notion of electronic music. The third part of the work dells with the political situation of Peru, and how this situation relates to music production. It also generates a basic set of values informed by social strategies presented and used by the population of the country, a more specifically: Lima's urban setting. Finally, the last chapter will show a musical interface as an example that shows possible applications of this set of values.

I will also examine through this work the problems of ethnographic authority, musicological expertise and technical and musical academic training as systems of segregation and the way these problems are reflected in the development of musical options for this particular sub-culture and social group. I consider this paper, also, as an addition to the critical discourse of what can be broadly defined as post-colonial[1] theory. I will make the argument that the participation of Peruvian thinking -through the members of the musical community (including myself) - is a necessary element for a musical dialog. This paper will serve as a participative memory that adds the Peruvian side to a bridge that needs to be built and maintained between the communities I present and discuss here and the international community, artists and institutions that can support with their resources and knowledge the development of their particular, unique and self-defined musical activities. On a more personal note, I hope to give back to the communities that have nurtured my up-bringing for many years, both as a regular citizen of the hard-to-define political construction known as

1"Although there is considerable debate over the precise parameters of the field and the definition of the term "postcolonial," in a very general sense, it is the study of the interactions between European nations and the societies they colonized in the modern period". Deepika Bahri, "Introduction to Postcolonial Studies," Postcolonial Studies Website, Emory University, 1996, http://www.english.emory.edu/Bahri/Intro.htm.

Peru and as a musician in the capital city of Lima.

I consider that there is need to improve the options for the development of systems of appropriation of foreign musical technological applications to stimulate musical constructions that the Peruvians can define as their 'own'. I am not particularly interested in the generation of new musical languages or global variations of local musical traditions, but in the smoother connection between technology and performer in a place were it is needed. The bridge between the electro-acoustic academic user of technology and the popular musician that 'grabs what he/she can' (both conceptually and technically) must be shortened to allow the crossing from one side to the other when desired. Some problems presented by this work might seem banal or superficial for those academically inclined to discuss more complex musical systems that could arguably be considered to have a technical or artistic superiority over others. I believe this is not a simple question of taste. Popular music has taken for the most part of the History of Western music a position of submission and subjugation to the world of the academic 'expert'. This basic problem of discrimination of musical manifestations might become more uncommon as most ethnomusicologists today, as Bruno Nettl states: "consider all musics worthy of study, recognizing that all, no matter how apparently simple, are in themselves inordinately complex phenomena."[2] Still, while the boundary between the representatives of high culture and those claiming, or being defined by others, as part of popular culture has blurred in the last decades, the distinction is still present inhibiting a dialog that would benefit both sides. All aspects of this conversation, I believe, are part of a necessary step toward an 'understanding' of a group in the way it defines itself and to clarify the relationship of the members of the

2 Bruno Nettl, The Study of Ethnomusicology: Twenty-nine Issues and Concepts (Illinois: University of Illinois Press, 1983), 14.

group to other musical worlds.

This work can be considered ethnocentric in a different sense from that of the traditional post-colonial critique, since it relies on Peruvian assumptions about Peruvian practices. It is based in the hope that Peruvians can develop systems of self-understanding and solutions to their own problematics, without having to defend or claim authenticity to be included into someone else's narrative to fulfill the need for an easy-to- understand yet 'authentic' representation of non-Western music for a Western ear. As Bruno Nettl points out: "[i]n their consumption of music, tourists usually hope for something authentic, old, explicitly non-Western or non canonic; but also they want to be entertained by something they can tolerate in the context of their Western musical taste".[3] I argue that this 'tourist' approach is also common to music scholars whose neutrality is impossible to measure, and whose research is in many cases highly tainted by the way they view and are viewed by their informants. Total objectivity and the finding of 'genuine' or 'authentic' information are fading in favor of understanding relationships with the 'other' that requires additional tools. For instance, a contemporary autoethnography needs to be able to claim to be a tool "under which every heretofore silenced group might enunciate, from its own location and according to its own agenda, its vision of itself and the world".[4]

Therefore this work is partially an autoethnography in which I participate as a member of a community, as well as a visiting foreign scholar; as part of a musical scene and as a tourist.

This text proposes taking notice of the contextual elements present in a multi-

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3 Ibid., 194.

4 James Buzard, "On Auto-Ethnography Authority," The Yale Journal of Criticism volume 16, number 1 (2003): 61-91.

structured and highly fragmented social construction known as the city of Lima, as a source for understanding the musical need of such a community. More specifically it attempts to define a community of communities, discuss its strategies and characteristics, and finally to use this information to make design decisions for interface construction and application. While it is difficult to consider the city of Lima as a unity, the hybrid culture (or cultures) that has been in the process of generation since the big migrations to the capital in the 1940s have enough of an identity, however complex and difficult to analyze, to come up with a general set of characteristics and values, as we will attempt to define in the third chapter of this work.

The point of unification between the communities we mention in this work is to arrive at a use of technology for both conceptual and aesthetic purposes. While the communities 'unified' here might not necessarily coexist or be part of an integrated musical scene, the different directions they have taken can be traced back to their historical connection to the development of technology and an infatuation with it.

The characteristics and strategies present in the Peruvian context, and Lima's manifestation of this context, should be considered as an essential source of information for the design of bridges between technology and its use in a music making logic that fuses into the landscape without a feeling of appropriation or borrowing under an unequal arrangement. The Peruvian musical world lacks a culture of musical interface design and consequently the suitability of the machines used for musical production is not investigated or tested but merely 'received'. The selection of tools ad hoc to Lima's urban situation by Peruvian musicians does not use any evaluation methodologies or investigative means other than an empirical and intuitive selection among scarce resources.

Several questions have to be answered in order for this paper to come to

practical and beneficial conclusions about both the needs and possible future for the application of technology for music making by Lima's popular experimental electronic community. One would be what characterizes the Community and who its members are. A second question is how they relate to the technology (both hardware and software) they apply to their musical constructions. And finally, how they envision their future connection to technology based on their current situation. After trying to find answers to these questions I'll present my own resulting interface designed according to the 'values' proposed by this research.

1.2 Methodology and Motivation

Certain general methodological and conceptual precisions are needed to understand the set of premises on which this work relies.

Since the publication of *Orientalism*[5] by Edward Said in 1978, critique of traditional Western mechanisms for acquiring knowledge about their ex-colonies has become common, and the development of notions like 'situated knowledge' and the 'politics of location' has become useful in reassessing the relationship between the academic world and its 'subjects' of study. For instance, in 1988 following "...strenuous critiques of ethnography from within and outside the discipline"[6], the influential journal *Cultural Anthropology* published a special issue devoted to the "problems of place and voice" it identified as "vital" to ethnographic representation."[7] However important this addition of the voice of underrepresented people has been to the academic world, it is still a matter of discussion. Authors like Deborah Reed-Danahay consider that

5 Edward Said, Orientalism (New York: Pantheon Books, 1978).
6 Buzard, "On Auto-Ethnography Authority", 61.
7 Ibid., 61.

autoethnography "…synthesizes both a postmodern ethnography, in which the realist conventions and objective observer position of standard ethnography have been called into question, and a postmodern autobiography, in which the notion of the coherent, individual self has been similarly called into question".[8] For authors like James Buzard when it comes to autoethnography, we have not developed the tools necessary to use it to acquire authoritative knowledge of a culture, "largely because of the persistent ("essentialist") assumption that one doesn't really *need* to explain how one acquires authoritative knowledge of "one's own culture."[9]

This being said, I defend the idea of the middle ground of 'participant observation' in which a member of a community can also claim the level of objectivity of an academic that is, for better or worse, needed to gain an understanding of a cultural manifestation and to increase the levels of communication between different audiences. As Michael Genzuk states:

> Participant observation is an omnibus field strategy in that it simultaneously combines document analysis, interviewing of respondents and informants, direct participation and observation, and introspection. In participant observation the researcher shares as intimately as possible in the life and activities of the people in the observed setting. The purpose of such participation is to develop an insider's view of what is happening. This means that the researcher not only sees what is happening but "feels" what it is like to be part of the group.[10]

I was born in Barcelona, Spain, but moved to Peru in 1974 (at age 7) and stayed until 1992 when I moved to the United States to pursue an academic career.

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8 Deborah E. Reed-Danahay, ed., Auto/Ethnography: Rewriting the Self and the Social (Oxford: Berg, 1997), 2.

9 Buzard, "On Auto-Ethnography Authority," 62.

10 Michael Genzuk, "A Synthesis of Ethnographic Research," Occasional Papers Series. (Los Angeles: Center for Multilingual, Multicultural Research (Eds.), Center for Multilingual, Multicultural Research, Rossier School of Education, University of Southern California, Re-printed 2003).

During my time in Peru I participated in the musical scene and got an early infatuation with technology, as I explain a little in Section 2.1. While as an academic I wear 'many hats', a strong part of my social and cultural identity is centered in Lima. Since 1997, when I moved to California and recovered my connection with Latin America thanks to its proximity to Mexico, I have participated directly in two musical scenes: Tijuana, Mexico, and Lima, Peru. Some of my activities in the Peruvian scene will be mentioned in this work and sometimes used as preferred information, especially when they displace other information for lack of proper details or reliable data. I will balance the information between events that are of major importance for the history of this Peruvian Community and those that were relevant to me in my process of participation and understanding. It should become obvious that this 'reading' of the Community is one of many possible ones, and that each part of this work can produce a longer and richer analysis that I hope the future will allow me to present. My interest to do research about the Community and my need to participate in a process that might help the development of musical scenes of Peru is clearly defined by Raul R. Romero, a Peruvian ethnomusicologist, in a statement about his own research:

> I had made a conscious choice. This choice was made using an element alien to the process by which many "foreign" scholars select a country, region, or locality to study: political involvement. But not "political" as in partisan politics, nor in the narrow sense of political activism, but as loyalty to a collective project by a group of people gathered around a town, a region, or a nation. I, as most Third World social scientists do, study our own countries not only to exercise intellectual abilities but in the hopes of contributing to social transformation.[11]

In the same text, and to clarify even more the position common to many 'Third World' researchers, Romero includes an important statement made by Mafhoud

11 Raul R. Romero, "Tragedies and Celebrations: Imagining Foreign and Local Scholarships". Latin American Music Review 22.1 (2001): 48-62.

Bennoune in 1985:

> A Third World Anthropologist like myself cannot simply indulge in the luxury of studying the cultures, societies and especially human conditions of the powerless and marginal peoples either of the Third World or other regions of the globe for the sake of knowledge but rather for the possibility of changing and developing them. The anthropologist of advanced capitalist countries tends to think, subconsciously or consciously, that the underdeveloped nature of the communities they study, in relation to their own societies, is a natural and even normative acceptable condition.[12]

1.3 The Problem of Definition

The Peruvian cultural context, like many others, produces a social dialog between opposing social groups. While the dichotomies that are produced in the name of scholarship to represent these groups are oversimplifications of more complex systems, in this case some of these distinctions can bear results useful toward understanding the problems I will present. Clarifying the existence of three basic pairs of opposites in Peruvian society will become helpful during the reading of this work: (a) the existence of a clear cultural distinction between the elite and the popular, (b) the existence of a post-colonial questioning of the self and the other, and (c) the existence of an economical distinction between official and informal. Analyzing the importance of these opposing groups is not part of this work. However, knowledge of their existence essential for a comprehensive notion of the elements influencing the Community analyzed.

There is also a problem with defining certain musical traditions in Peru as popular music. Chica, Tecno-cumbia and what is termed sometimes as Musica Tropical

12 Mafhoud Bennoune, "What Does It Mean to Be a Third World Anthropologist?" Dialectical Anthropologist 9(1-4) (1985):359, quoted in Raul R. Romero, "Tragedies and Celebrations: Imagining Foreign and Local Scholarships". Latin American Music Review 22.1 (2001), 1.

are genres that could fall into a definition of popular music, as "mass mediated music that constitutes, eponymically, the kind of music loved or liked and known throughout the world"[13] (in this case 'a' world). We are working here with small communities that represent larger virtual international communities and not massive groups of Peruvians. While the appropriation and practical use of electronic instruments has achieved the activation of a real massive popular musical world with Chicha and Tecno-Cumbia, more 'advanced' musical technologies have yet to have an echo in this popular scene. The division we use in this paper is that of the dichotomy between academic and popular (that is, trained versus untrained in the world of higher education). Most of the members of the Community base their work on mimetic techniques and do not intend to create works that are culturally unique. The globalized Peruvian representatives of world music, for instance, also rely on this mimetic technique, since for the most part they have been unable to generate new styles and are reduced to transplanting universal templates with Peruvian elements, the only difference being their claim to uniqueness by the use of samples or live performances by traditional Peruvian musicians on top of pre-defined contemporary global electronic styles, as we will discuss in Section 2.5. Finally, although it is impossible to see the future, it is a hope on my part that this paper will provoke an 'insider's' dialog about possible options for confronting technology. I believe this conversation is already in progress as some parts of this paper will explain.

1.4 Negotiating the Glocal

At the same time that the academic world was dealing with the creation of

13 Nettl, The Study of Ethnomusicology: Twenty-nine Issues and Concepts, 187.

spaces for self-critique and multidisciplinary and all-inclusive systems of inquiry, the notion of a unified world and an integrated global system was rising, Globalization, a term we commonly use to define this process, was considered by Noam Chomsky as "a term of propaganda used conventionally to refer to a certain particular form of international integration that is (not surprisingly) beneficial to its designers: multinational corporations and the powerful states to which they are closely linked."[14] The political implications and power struggles of this idea underscore the need for participation. From 'participant observation' to the generation of a 'language of participation',[15] the generation of a memory of current events and the mapping of specific cultural 'territories' -in this case the representation of a experimental electronic music scene of Peru- requires the presence of all possible voices; whether we want to call them authentic, objective, fabricated or a cultural hybrid combination.

The development of global systems of human standardization and the process of combination of cultural forces that has been taking place, arguable, since 16th century European global exploration, was received favorably by idealistic cultural movements like the 1980s futurists in the United States. Based on romantic notions of human civilization as a synonym of continuous human progress, and with an infatuation for technology, they saw a human of the future with no cultural attachments.

FM-2030[16], an important proponent of transhuman ideals "predicted" a reality

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14 Noam Chomsky, "Corporate Globalization, Korea and International Affairs," interviewed by Sun Woo Lee, Monthly JoongAng, 22 February 2006, http://www.zmag.org/znet/viewArticle/4362.

15 Markus Miessen and Shumon Basar, ed., Did Someone Say Participate? An Atlas of Spatial Practice (Cambridge, Massachusetts: The MIT Press, 2006), 18.

16 FM-2030 was a transhumanist philosopher and futurist; born Fereidoun M. Esfandiary (October 15, 1930–July 8, 2000).F.M. Esfandiary changed his name to FM-2030 for two main reasons. Firstly, to reflect the hope and belief that he would live to celebrate his 100th birthday in 2030; Secondly, and more importantly, to break free of

that had in fact already been in the works for quite some time, a reality in which the notion of a collective identity will be eradicated from human (or transhuman) social life. He stated for instance that:

> Conventional names define a person's past: ancestry, ethnicity, nationality, religion. I am not who I was ten years ago and certainly not who I will be in twenty years [...] The name 2030 reflects my conviction that the years around 2030 will be a magical time. In 2030 we will be ageless and everyone will have an excellent chance to live forever. 2030 is a dream and a goal.[17]

FM-2030, like other futurist of the time, did not expect the post-colonial backlash of regional independent thought and the revitalization of the term 'local' as a metaphor for the right to an 'individual' non-globally defined existence. In this paper I argue, that the community of electronic experimental popular musicians of Peru bases its activities, whether individual members are aware of this situation or not, on conditions local and particular to Peru, conditions that have to be explored for a proper understanding of the community's musical output.

Not all communities or single members of a community have happily embraced the possibility of the elimination of their cultural particularities and the possible 'loss of ideas' for the sake of homogenization. The activities of the Peruvian community we study here demonstrate an eagerness to engage in identity politics and an awareness of a condition of marginalization both globally and locally. This eagerness has not always resulted directly into political activism more often taking a critical position against institutions and the systems for distribution of audio controlled by the music industry, mass media, and the mechanisms of 'legality'. Officialism and

---

the widespread practice of naming conventions that are rooted in a collectivist mentality, and exist only as a relic of humankind's tribalistic past.

17 Flora Schnall, longtime friend of FM-2030, from audio recorded conversation quoted on http://en.wikipedia.org/wiki/Fm_2030

Informality are the two sides of a system that allows Peruvian society to continue functioning. When a musician in Peru declares independence from the 'formal' or 'legal' way to do things, this affirmation of difference helps maintain a separation that keeps him/her from being subsumed into mainstream culture. As Jean Baudrillard states: "consumption is an active mode of relations (not only to objects, but to the collective and to the world), a systematic mode of activity and a global response on which our whole cultural system is founded."[18]. I believe the control over the systems of consumption, and by extension production and distribution, helps define the 'psychological' state of a community. If that community does not feel capable of accessing mass media means of dissemination of what will became popular culture, or the corporate and commercial entities that control the means of production, distribution and consumption, it will find alternative ways. The way that most of the musical community deals with this process, by subscribing to the 'informal', shows the need for a kind of consumption they can call their own. Most members of the electronic music community of Peru feel more comfortable sharing the spaces for the sell of their music with informal vendors and stands full of pirated CDs than with participating in the 'official' distribution of 'legal' audio.

We will discuss some parts of the political history of Peru during this work, especially in Chapter 3, to understand possible sources of suspicion that might have made musicians feel more comfortable outside the frame of the official political and social system.

Many of the new human systems for communication and networking (the Internet for instance) assume a notion of universals as well as a respectful agreement

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18 Jean Baudrillard, Selected Writings (California: Stanford University Press, 1988), 21-22.

about the need to support diversity. While labeling humans according to particularities was for a while considered as an unhealthy divider; this notion has been revitalized to meet a need to include the contextual forces for the generation of a sense of meaning to both the environment and the beings living in those environments. The space/territory of inquiry we are constructing for this work needs to be defined according to all the possible elements that it presents us, including both the qualities of a progressive universal vision, and the internal and unique values that the contextual sub-levels provide. In other words, when confronting the musical world of the Peruvian musicians of this particular community with our traditional methodological tools, new concepts and vocabulary arise from the process, and the heterogeneous nature of the phenomenon comes to light. The process of inquiry itself proves the need to encompass local input and global academic notions.

I rely on a human definition, in which the geographical region or the basic levels for self-mirroring can be accepted: a self-identity that "is not that of a substance, nor is it a process or even an activity; rather it is a self-identity related to *place* ..."[19], allowing the inclusion of regional elements of culture as a basic element for self-awareness. The need for this notion can be easily attributed to the loneliness produced by the loss of referents in the post-modern success of the modernist dream of a world where Le Corbusier's chair in the *machine a habiter*[20] would be a chair anywhere. Le Corbusier's belief of the home as a machine for living shows an interest in

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19 John C. Maraldo, "Self-Mirroring and Self-Awareness: Dedekind, Royce, and Nishida," in Frontiers of Japanese Philosophy (Nagoya: Nanzan Institute for Religion & Culture, 2006), http://www.nanzan-u.ac.jp/SHUBUNKEN/publications/EJPhilosophy/PDF/EJP2-Maraldo.pdf

20 Le Corbusier's proposal was the generation of a standard for construction that would make the house a 'machine for living in', a universal machine useful for all human beings regardless of their cultural situation.

understanding the human and his/her world as machines whose functionality can be found and universally applied, and the notion that culture can be excised from the artifacts of daily living. I claim that this vision is incomplete and that objects, and in this case musical interfaces, carry cultural elements with them. By paying attention to the characteristics of a society we can develop better tools for their populations, and by ignoring them force communities to forget their cultural resources and struggle to adapt.

In any case, and without a complete understanding of all the possible reasons behind it, we find ourselves in a historical moment in which the structures of behavior that could be attributed to the condition of belonging have acquired new value. Family, neighborhood, race, club, regionalism, nationalism and other 'close' terms, can now be seen with new romantic eyes instead of as an obstacle for human development. The idea of extracting useful strategies out from 'other' culture-specific environments is just a democratization of the initial European notion of extracting universal ideals for the good of humanity from European mythological biases, as applied to the world throughout the colonial period. In the same way as eurocentric notions have helped the preservation of European musical heritage, multiple ethnocentric views will help in the preservation and flourishing of musical variety. I find myself sympathetic to Bruno Nettl's notion that a "social and political activism in opposition to colonialism or neo-colonialism and in support of minorities, and perhaps more typically, of a kind of musical activism which insists that the musics of the world's peoples must be protected, preserved, taught, and the musicians treated fairly and with respect."[21] It Is within the context of this appreciation for the small networks of

21 Nettl, The Study of Ethnomusicology: Twenty-nine Issues and Concepts, 15.

human interaction, both physical and virtual, in which humans find common grounds for communication, that this work attempts to make a contribution.

This text bases its questioning on an exploration of a particular musical population in a particular geographical and urban setting. It might be considered by some that it is a stretch of the imagination to consider the fieldwork presented in the first part of this work as part of the academic traditions of Musicology or Ethnomusicology (without a hyphen). The musical subcultures discussed are, for the most part, formed by artists with no particular musical training and with their eyes focused on foreign musical cultures. The research presented is not directly related to musical insights about the communities discussed, but to the strategies and characteristics that are found when analyzing the human activities of a group and can be used and interpreted for future application in the music making process and technological development in the popular context of the communities mentioned.

The conclusions of this work add to the contemporary discussion in the humanities and cultural studies about the 'Politics of Location' and the need to continue collecting information from particular cultures and generating conceptual tools to analyze the information that emerge from the members of the community itself. Since at this point the musical communities analyzed here are not part of the academic musical world and not included in music industry catalogs either; collecting its cultural information "...implies a rescue of phenomena from inevitable historical decay or loss."[22]

During most of the history of the Peruvian republic, Lima has been the center of

22 James Clifford, "On Collecting Art and Culture," in The Predicaments of Culture: Twentieth-Century Ethnography, Literature, and Art, 215-252 (Cambridge and London: Harvard University Press, 1988), 231.

attention both of the internal political system and the international community. While this has resulted in the neglect of large sectors of Peruvian population, it has also encouraged a migration that has helped perpetuate the problem of a centralized Peru.

As this paper is interested in musical environments commonly not part of the academic discussion about electronic music communities or digitally processed and produced music, it is only to be expected that many of the sources used to obtain information are not the traditional bibliographic ones but personal interviews and experiences, and Internet sources. Internet pages like www.wikipedia.org and multiple project pages hosted on www.myspace.com have been of great help. Conferences, conversations, informal papers, radio shows, fanzines, event flyers and other alternative sources of information were in many cases more helpful than the incomplete or scarce traditional archival means. All personal conversations and electronic communications were done in Spanish and I am responsible for the translations. I had multiple conversations, and still on-going dialogs, with most of the people mentioned in the Personal Communications section of the bibliography, the dates presented refer to the specific conversation being used in this work, while many other useful and more informal conversations have taken place. Since there is no formal source of information at the time preserving the activities of the electronic experimental communities of Peru, I hope this work serves as an initial exploration that may be augmented by more precise and complete chronicles of the events mentioned.

Chapter 2

We Wished We Were the Robots: The Peruvian Electronic Music Communities 1985-2008

we're changing our battery
and now we're full of energy
we are the robots
Kraftwerk - 1977

The music explored in this section can not be considered the particular property of a population or regional group. However the Peruvian youth of the 1980s, excited by images of musical technological progress, as it was presented by popular movements of Western musical *Avant Garde*, produced a unique cultural variation that deserves attention; not because of the uniqueness of their musical output which as we will see in many cases only echoes world musical movements, but because of the uniqueness of their experience as members of a politically charged and economically challenged environment. Following generations of artists have also shown this infatuation with the completely alien 'beings' that every generation brings to its different magic boxes (television, Internet). Understanding music within a particular cultural setting requires that one avoid looking for universals and instead look into the ways a musical

manifestation becomes unique to an 'instance' of its historical process.

In this chapter I am interested in (1) exploring Peruvian variations of European musical popular cultures, (2) archiving information regarding their musical work, and (3) analysing and reporting their cultural circumstances and activities as they inform and transform their process of musical appropriation. What this chapter will not be focusing on is: (1) an analysis of the musical products of the Community, or (2) the search for 'native' musical characteristics or the definition of new 'folk' niches over which Peruvian ownership can be declared. Rather than being preoccupied with defining a unique identity for musical styles of obviously foreign origin or with claims of musical 'ownership' over its musical results, this paper subscribes to a notion of musicological research that understands 'all' contemporary music and 'all' possible population groups as possible targets of inquiry.

My interest in cultural musicology, as Joseph Kerman wants to define ethnomusicology,[23] seems to include me on Bruno Nettl's description of the usual suspects of ethnomusicological work in the United States[24]. According to this notion one would assume that I come from a background in popular music, that I have been exposed to what he defines, using the old terminology, as 'third-world' cultures, and more specifically that I had a long period of living in this non-Western culture called Peru. While I don't claim training in Musicology my undergraduate thesis work on Comparative Studies and the relationship between European constructions of Latin-American identity has been helpful to define phenomenological and methodological plans for the acquisition of the body of data being examined here.

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23 Joseph Kerman, Contemplating Music (Cambridge: Harvard University Press, 1985).

24 Nettl, The Study of Ethnomusicology: Twenty-nine Issues and Concepts, 5-8.

I have decided to use, as a manageable historical range for this research, the communities and independent musicians working with technology from the 1980s on. ¨Most of the work in computer music between 1955 and 1980 was classified as ¨research¨ and was done in universities; much of the work in developing real-time performance systems has been done by commercial enterprises¨[25], and it is in the 1980s that real-time performance using synthesizers took advantage of both research and technological applications to main stream popular music. This period is important since it marks the rise of affordable synthesizer manufacturing for the regular consumer. This is also the time when the new rebellious youngsters of Peru found for the first time a machine willing to take decisions for them and help them design a musical statement as a partner in crime, maybe even with more musical rights than them. I am particularly interested in those sectors of the musical population with no musical training and those who took advantage of the musical technological revolution that brought the possibility of making music to anyone with the desire but not necessarily the knowledge. This first period of accommodation to the machine lacks, for the most part, musical innovations and regional mutations relevant to this research; however they are useful to discuss a social setting that is still present and relevant to the new generations of electronic musicians in Peru.

Most of the information obtained about this period and the popular electronic scene in Peru was obtained through personal experience, interviews with members of the different sub-communities, and informal Internet sources. As far as I know there are no academic studies at the moment about this particular musical context. This is why this sections of the paper lacks, for the most part, bibliographical academic support

25 Charles Dodge and Thomas A. Jerse, Computer Music: Synthesis, Composition and Performance (New York: Schirmer Books, 1985), 323.

and relies on informal content. A serious investigation and rigorous and methodical research is needed, including a basic preservation process of relevant materials and the definition of the 'fields' and 'micromusical' networks present. This investigation requires the possibility for the 'other' to define its self as a hybrid product of colonial upbringings, a part of the western musical world as well a a member of the 'other'.

However incomplete, this part of the paper acts as an initial account within the academic world of these musical spaces, a small recollection of basic information of empirical data. The implications of this perhaps academically suspect undertaking are not light; however there is a certain urgency to make official the existence of this period and its importance in the process of evolution of popular electronic music in Peru, became at the time more important that methodological exactitude.

This period gave rise to several communities with very different musical and social views (that we will describe in this chapter); however, there are still elements that unify them regardless of the musical differences. While discussing the process of transformation of these different communities from the 1980s until today, this text will focus mainly on the current experimental popular electronic communities of Lima.

2.1 The Rise of the Synthesizer: Peruvian Synth Pop

This period includes the first use of synthesizers as a conceptual basis for musical construction by the Peruvian variation of the Synth Pop movement during the early 1980s. While many New Wave bands at the moment used synthesizers in their musical practices, in many cases they considered it an addition to innovative variations or a continuation of rock and roll techniques.

The Synth Pop movement started a process of pushing out the picture the traditional instruments of rock and roll, and their main representative musicians were

looking carefully at the new musical aesthetics the synthesizer could produce, while having an infatuation with the notion of a robotic machine, a machine that does not sound human. Gary Numan, for instance, abandoned guitars to produce the track 'Down in the Park'[26] in 1979[27] and Devo managed to use guitars to mime the logic of the synth and the drum machine. They later became one of the first bands in the United States to perform live with mostly synthetic instrumentation, giving us a sound whose source was at many points hard to identify. The Peruvian scene, as we will argue for all periods, was unique for the Pop Synth community but in the case of these first users of synthesizers the mimetic musical aspects had higher importance that in future groups. The first projects that based their sound completely on the machines did not have access to equipment to copy or imitate their European idols. While the aesthetics were similar, the results rapidly disappeared because of lack of access to sequencing equipment or recording studios. The aesthetic decisions taken during this time where also dependent on the technology available. An anecdotal example could be the work of my own musical project in 1989, La Secreta Identidad. Since we were unable to have a sequencer, to play live we would record tracks from the synthesizers into a cassette tape, one side of the stereo signal for bass lines and the other for rhythmic lines and percussion. We would play the tracks in the background while performing with keyboards, drum machines and guitars on top of the previously recorded tape. This is meaningful in the sense that while, as Stanley Haynes wrote on 1979, ¨the most distinctive innovation offered by computer-controlled digital synthesizer is the possibility of preparing in advance material which may be accurately reproduced in

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26 Gary Numan and Tubeway Army, Replicas, Beggards Banquet, BEG 50 638.

27 "Down in the Park, on the other hand, was Numan's first composition on keyboards and his first release to feature the predominantly electronic sound that became his trademark." From http://en.wikipedia.org/wiki/Down_in_the_Park.

performance but may also be modified using real-time controls"[28]; only the aesthetics produced by this innovation reached many of the Peruvian musicians. Multitracking was a conceptual tool and just the knowledge of its existence was influencing musicians, even if in practice the dream of multiple layers of automated sound and controlled playback was not viable for many at the time.

Another interesting aspect of this particular sub-culture of the Peruvian electronic scene is the lack of interest on the part of the other electronic music communities in their work. Even thought other electronic music communities in Lima don't belong to the academic world, there is the notion of internal differentiations between musical styles and conceptual biases for musical production. More contemporary and new Peruvian variations of electronic music are considered by a self-declared intellectual elite as more advanced conceptually and deserving more attention and appreciation. It has been my experience that this situation is common not only to the Peruvian Community but to similar communities in Latin America, where musicians have to declare their expertise based not on professional training and education but on an informal system of internal criticism where self-declared experts get acknowledged (or not) by the public as reliable sources of information in a similar way as music is accepted or not as good or interesting. This could be the case for experimental electronic and electro-acoustic music of Peru. One possible reason behind this untrained interest on conceptually complex and academic-like musical discussion is the lack of possibilities for intellectual training on the sound arts in Peru. There are no programs in the country dedicated to sound and technology at this time, and this produces the need for self-training, self-reliance, and informal knowledge

28 Stanley Haynes, "The Musician-Machine Interface in Digital Sound Synthesis." Doctoral Dissertation (Southampton University, Southampton, England, 1979), 139.

acquisition. This is not only a direct result of the need to pursue personal interests regardless of the options available, but again, a critique against established systems of intellectual power and a logical result of the Information Revolution. In the case of the Community in Peru this is not directly related to a sense of economical and market oriented knowledge, but that of a informal system for the distribution of knowledge based both on contemporary access to public information and the value of personal information not 'qualified' by the world of the university.

The initial musical knowledge of the Synth Pop community comes through imitation of European musicians and the operation of the machines they would be able to collect. Most of the synthesizers used were of the Casiotone series of home electronic keyboards develop by Casio during the 1980s. These keyboards used a synthesis technique known as Vowel-Consonant synthesis, a technique that uses two digital waveforms, which are mixed and filtered by a static low-pass filter, with different filter positions selected for user according to presets.[29] There was no access to the synthesis processing or possibilities of variating the presents. This system attempted to imitate the sound of other instrument with not very accurate results which in result gave the Casiotones the mechanical and 'robotic' like sound that fit perfectly into the conceptual basis of Synth Pop. Many Casiotone models were very small and used miniature keys showing that they were designed thinking on the children market and not the professional musician. Most of these keyboards included rhythm generators and automatic accompaniments with drum beats and bass lines which made them an efficient tool for a 'complete' band sound with only one or two keyboards. Finally, their cheapness makes them very accessible and easy to find. As Jorge Gonzales of the

29 From: http://en.wikipedia.org/wiki/Vowel-Consonant_synthesis, and http://encycl.opentopia.com/term/Casiotone,

band Ensamble tells me on a personal interview[30]: "legal imports were hard to come by, and many times we would go to the few stores that had keyboards, like Importaciones Hiraoka[31], and just be happy trying the keyboards they had".[32]

The first known attempts to apply the 'aesthetics of the machine' in Peru were the projects Ganesh, Pozi, Cuerpos del Deseo and Disidentes (Later becoming T de Cobre), this last one more interested in the Industrial aesthetics and sound. It is during the second half of the 1980s that these bands started to generate sound based mostly or exclusively on low-budget synthesizers, especially the home consumer series made by Casio and Yamaha. Not long after (around 1989) groups like Ensamble y Circulo Interior (later known as Unidad Central) made their official appearance into the nascent scene. A couple of festival presented the work of these and other artist representing Peruvian versions of foreign movements and some eclectic projects of the time: Sonidos Latentes, organized by Giuseppe 'Pino' Risica[33] at the Casona de Barranco (see figure 1) and Sintomas del Techno (in El Teatro La Cabaña). The first one was a very eclectic event that included bands of many different styles but between them some of the first Synth Pop bands that we have mentioned. And the second one is commonly considered the first gathering of the Peruvian Synth Pop community.

The last one of this first period of groups is Arian 1, presenting its work on 1992. During this period the genres were not as complexly defined as now. Many of these

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30 Personal interview: June 9th, 2008.

31 http://www.hiraoka.com.pe/qsomos.html

32 An alternative to the Casiotone were the Yamaha Porta Tone (PSS) and Porta Sound (PSR) portable series, equally cheap and easy to obtain, while also versatile and easy to use.

33 During the end of the 1980s Giuseppe Risica was a big musical promoter mainly through the publication of a magazine called Cuero Negro. The organization of Sonidos Latentes was a venture outside of his normal participation on the Metal and Punk scenes of Lima.

projects have evolved with time to find themselves defined by more complex systems of classification that include styles like Future Pop, Electro, EBM or Electronic Body Music, Minimal Electro, etc.

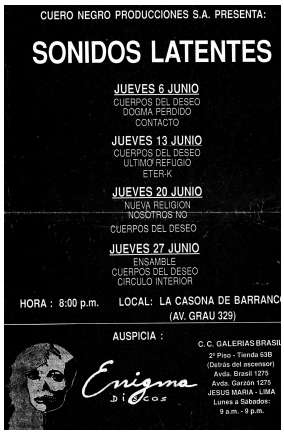

Figure 1: Sonidos Latentes flyer.

These first electronic projects had to deal with the initial confrontation with the 'traditional' instruments of the rock scene. Many saw the machines as doing all the work for the musicians without much artistic input from them. Discussions about who was doing more, who was programming and who was just playing what the synthesizer had to offer were not uncommon. There was a need to demonstrate musical skill and actual participation in the process of musical real-time making. Festivals for young and new music would sometimes 'disqualify' groups for 'excessive' use of sequences or synthesizers, since they were considered as a way of cheating[34]. Even within the emerging Synth-Pop community the level of use of pre-sequenced work was looked

34 A personal experience of this process was the first rock festival organized by the City of Miraflores in Lima. The bands that included sequences would unofficially lose points in front of full rock bands for their 'unprofessional' performance of pre-sequenced tracks.

upon suspiciously.[35]

During the last years the Synth-Pop community of Lima has seen attempts to get unified in an effort to maintain and develop the style and its informal community alive. Under the name of Area 511 and as a result of a prior job in the creation of a compilation tribute to the work of the English band Depeche Mode released at the beginning of 2008, most of the members of this community have gotten together to promote the generation of a representative double CD that will see the stores (the underground networking most likely, that is) by the end of 2008.

Figure 2: A meeting of the Synth-Pop community (May 2008)

2.2 Initial Noise Culture and the Experimental Scene.

The extreme logic of all the musical styles that could fall under the umbrella of Noise Music has found Peruvians attentive and ready to generate sound and adopt

35 Jorge Gonzales of Ensamble claims to have coined the term 'fintetizador', a combination of the words finta (meaning in Peruvian slang 'to show off', as in not real) and sintetizador (Synthesizer), for those groups that did not 'performed' their instruments live. Personal interview, June 9, 2008.

dissonance and non-musical strategies. These styles are, as in Synth-Pop, pre-defined by non-Peruvian contexts[36] and are just manifestations of foreign musical evolutions. Some argue, however, that a connection can be made between these extreme aesthetics and the frustration produced by the constant economical crisis in Peru.

Referring to the period starting on the year 2000, Luis Alvarado Manrique in his article "El sonido de la crisis**:** *noise* y música industrial en el Peru" considers that: "[t]hese are years in which Peru lives a very strong political and moral crisis. Many students hit the streets to protest for their discontent, while evidence of corruption its made clear by the exposure of the "vladivideos".[37] Alvarado considers also that "while the amount of experimental electronic music made after the year 2000 is not more or better than the one made on the 1990s, it becomes more visible thanks to its invasion into the circuit of the visual arts" and that "the electronic and experimental sound artists became mixed with the visual artists and interdisciplinary festivals got organized, like Modular park-o-bahn, el laberinto sonoro, electrocutarte, and looperactiva".[38]

In Chapter 3 we will talk in more detail about the political conditions in Peru that could have become a detonator and nourishing agent for a culture of aggressive response against social conditions, including the punk influenced Movimiento Subterraneo and the later sound styles we discuss here.

It is common to include mention of a 'chronic' political, economical and moral crisis in most discussions in Peru. It is hard to define at this point if this continuous mentioning of 'the crisis' as an essential elemental of cultural construction is the result

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36 An obvious proof is the English terminology used by many to characterize their music within international noise standards: noisecore, grindnoise, ambient noise, noise gore, digital noise, etc.

37 Luis Alvarado Manrique, "El Sonido de la Crisis: noise y Música Industrial en el Peru" (Lima: Sonoteca Centro Fundacion Telefonica, 2008), 5.

38 Luis Alvarado Manrique, Personal Interview June 25th 2008.

of a present and existing crisis or if it has became a habit for the rhetorical discourse of the population. For instance, there is not enough evidence to claim that a crisis was an essential source of motivation for the generation of a noise musical culture in Peru or anywhere else. The existence of such musical manifestations all over the world and especially in small globalized communities can be easily found. In Lima underground systems of distribution of foreign music arose in reaction to the suppression of non-Peruvian popular music (especially rock) during the military regime of Velasco Alvarado. Small clandestine stores would place their precious foreign vinyls and cassette tapes on the walls and sell custom mixed recordings for the youngsters eager to access foreign music. As we will discuss later on this work, piracy was an essential anti-establishment practice and a necessary evil to achieve participation in international musical movements.

It is easy to connect a general urban discontent with the specific social conditions of Peru, after years of military regimes, and aggressive new musical popular movements. Understanding the political situation of Peru during this period is essential to understand the flourishing of Industrial and Noise projects in Peru. Political activism and social consciousnesses have been for many years elements of common discourse on Peruvian urban settings. In cases where musical European and American movement would rely on hedonistic value systems the Peruvian counterpart would include a political and social tint. The class clash of the dramatically fragmented, and still in many ways colonial, Peru, was also present in this musical interaction and, for instance, the hedonistic and superficial character of the new romantic English movement would find a Peruvian response that could not be free of political implications and class clashes.

It was at the end of the 1980s, at the end of the anti-establishment Movimiento

Subterraneo, that we find the first Noise bands[39]. These bands are not particularly interested or involved in the use of technology and are closer to the Punk Rock and Hard Core scenes. Distorsión Desequilibrada, was, in 1991,one of the first projects experimenting with Noise atmospheres combining processed keyboards with other more traditional sources like guitar feedback and sound samples. Even thought this project was more interested in the aesthetics than the hardware, it was an initial approach towards technology-based Noise experimentation. It was not until the beginning of the 1990s that groups like T de Cobre first (Industrial) and latter Insumision (digital hardcore) introduced technology for Peruvian Noise.

An important example of the use of affordable technology for Noise and Experimental musical production is the project emerging from the City of La Oroya at the end of the 1990s, Colores en Espiral. My first experience with this group was in 2004. A concert was organized and some musicians from Lima went to participate. Colores en Espiral used the standard equipmet we have discussed for the Synth-Pop scene: Casio mini-keys home electronic keyboards. A difference from the Synth-Pop would be the importance of analog guitar effect processors for the generation of ambient-noise textures, while maintaining part of the toy-like sound characteristics of the Casio keyboards. Examples of technology based musical projects from La Oroya can be found on the compilation record Mision Oroya, curated by Edison Carhuaricra Perez from Colores en Espiral, and released in 2008 by the netlabel Dinet[40]. It shows just a sample of the massive work this small mountain city of Peru produces.

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39 A good source of information on the history of the Peruvian Noise scene is the previously mentioned text by Luis Alvarado Manrique.

40 Available at: www.d-i-net.org/dimu006.html

2.3 Cosmic City: the La Oroya case

The case of La Oroya is a special one. A mining town with, as of the 2005 census,[41] population of 19,908. In a country where most of the development was reserved for Lima, and were a big percentage of the population lived in a state of abandonment from the main government, it was unusual to talk about a musical scene influenced by foreign styles outside of the region of the capital. Most regions of Peru lacked access to resources and in many cases the conditions had not changed in a meaningful way since the initial colonial period that generated the political construction we know now as Peru. While by some this lack of access was seen as beneficial in the sense that it could stop or retard the invasion of the 'alienating' forces of foreign capitalistic thinking and promote the development of non-media based musical styles (we will discuss this on Chapter 3), for others, this would be the sign of a lack of progress and the perpetuation of a condition of disadvantage for the popular masses. Hybrid musical products like the Peruvian Cumbia have shown the development of a mixed and mutated Peruvian identity which can survive the 'invasion' of foreign strategies.

In 2007 the Blacksmith Technical Advisory Board of the Blacksmith Institute included the small mining town of La Oroya in its list of the ten worst polluted places in the world.[42] The pollution is generated by a smelting plant of the Missouri based Doe Run Company, a company owned by Renco Group, and controlled by Ira Rennert. This billionaire New Yorker was the 1999 winner of The Awful Truth Man of the Year Award for

41 Instituto Nacional de Estadística e Informática, X Censo de Población y V de Vivienda, July 18-August 20, 2005, released on November 30th 2005.

42 http://www.blacksmithinstitute.org/ten.php

owning the single polluting industrial facility in the United States.[43] In 2006 accusations were made by Peruvian Congressman Calos Infantas Fernandez against Doe Run for using company workers to march in the city of Lima to support the company's proposal to postpone its environmental commitments until 2011.[44] In 2007 the Peruvian Congress released a report about the problem of the effect of the environment in public health in La Oroya declaring it in a state of emergency.[45] Ninety-nine percent of children living in and around La Oroya have blood lead levels that exceed acceptable limits, according to studies carried out by the Director General of Environmental Health in Peru in 1999.[46] How the quality of life in a place like La Oroya affects artistic output is a mystery at this point. While pollution is the first topic that arises when one speaks of La Oroya. Other than the presence of the mining company that takes most of the jobs, and the fact that is it a crossing place for people traveling between the mountains and Lima, is it hard to find a reason for the musical interest of the population.

During the last decade La Oroya has had a lot to say with a big output of musical pollution. Internet Radio, musical festivals and musical projects with national repercussion like Colores en Espiral have put La Oroya in the Peruvian musical map for electronic music. When asked about the origins of the musical culture of La Oroya, Edson Carhuaricra Perez of Colores en Espiral claims to have a stronger connection

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43 http://en.wikipedia.org/wiki/Ira_Rennert

44 Karen Martinez, "Doe on the Run?," El informante, 2, 2, 2006, http://www.minesandcommunities.org/article.php?a=868

45 Congreso de la República. Comisión de Pueblos Andinos, Amazónicos, Afroperuanos, Ambiente y Ecología. Grupo de Trabajo Ambiente y Ecología. Informe Parlamentario, El problema de salud pública ambiental en La Oroya, Lima junio 2007, http://www.aida-americas.org/templates/aida/uploads/docs/Informe_La_Oroya_160707.pdf

46 Blacksmith Institute, "The World's Worst Polluted Places. The Top Ten (of The Dirty Thirty)," September 2007, http://www.blacksmithinstitute.org/wwpp2007/finalReport2007.pdf

with the Nueva Ola movement, a South American post beatnik movement that started on 1959, than with the Synth-Pop initial synthesizer invasion that preceded his work with Colores en Espiral: "I have uncles that were very much into Datsun[47]" and "I know another generation more into the Nueva Ola and I believe that since the 1960's La Oroya has had a musical culture".[48] To support the existence of such a connection Edison tells me that the owner of the place where I was invited to play in 2004 as part of a festival "had played when he was young with Los Pasteles Verdes".[49]

Again, a political position becomes an important element for Noise and electronic experimentation in La Oroya, a certain disdain for the examples of the Synth-Pop revolution in Peru as they connect with fashion and hedonistic commercial imitation of foreign styles instead of a 'serious' musical work. However, there seems to have been a strong presence of Synth-Pop projects in La Oroya. Around 1994, the project Cosmicity, for instance, represented the local version of the English group New Order. A couple of years later the gothic project Cleopatra (including one of the initial members of Colores en Espiral, Oscar Cirineo) started using keyboards as accompaniment for their music. But it was not until the year 1997 that Colores en Espiral started using the same Casiotone equipment used by Lima's Synth-Pop community but with a completely different intention, not for the imitation of foreign styles but as a tool for sound exploration. This was accomplished by running the Casiotone outputs through guitar effect processor to generate psychedelic and atmospheric electronic soundscapes.

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47 Los Datsun's is a mythical Peruvian band from Huancayo, a region in the central mountains of Peru, an important example of the presence of the Nueva Ola outside of Lima.

48 Edison Carhuaricra, personal interview, July 1st 2008.

49 Idem. Los Pasteles Verdes was an important band in Peru during the1970s.

The last decade has shown a progression of this experimentation in the city, including several new projects. Three important festivals organized by the La Oroya music community to strengthen the link between la Oroya and Lima's electronic experimental communities should be mentioned. The first one, organized by Poseros Records, took place at the restaurant Caroli on Saturday the 15th 2003 and included the participation of important projects from la Oroya like Cleopatra and Colores en Espiral and Ertiub, Resplandor and Viajeros from Lima. A follow up of this experiment in July the 12th of 2004 organized by Clan Fraktal in the basement of the Caja Municipal was more ambitious and included more projects from Lima (Theremyn-4, Paruro, Patricia Saucedo, Reisser, Ertiub, El Lazo Invisible, etc) sharing a stage again with Colores en Espiral and Cleopatra. From July 28th to the 30th of 2004 the Festival Asteroide 1 took place including a total of 18 projects from both cities (an interesting addition to the festival was the inclusion of the project Quilluya from the important coastal city of Arequipa in Southern Peru).

Figure 3: Flyers, first events at La Oroya.

These concerts have served to make the musical community in La Oroya visible in Lima. The electronic and experimental scene is now completely aware of the old and prolific musical output of the city. The compilation Mision Oroya have mentioned before is the first attempt made to get many of these works together and available[50] La Oroya is thus a rare example of an experimental musical scene in Peru to receive at least some documentation and external exposure.

2.4 Other Contemporary experimentations

After the initial period of the 1980s and 1990s during which the scene for electronic music experimentation was minimal, we encounter a multiplication of options and projects during the last years. Multiple groups of musicians following the initial boom of the concept of 'collective' and 'laboratory', and independent record labels have worked on generating spaces for sound experimentation and include the new international trends of 'advanced' popular electronic music, putting the Peruvian public to the test. In 1999 a website claiming to be including the notion of 'aldea global' appeared on the Internet: 1001 Records. This project ran by musician Jose Gallo was an attempt to open an independent record label for musical electronic styles that could represent Peru as a participating member of a global community. As the statement for the record label pointed out:

> We probably live in a country were the fusion of cultures is what define us most. Before being Indians, Spaniards, etc, etc, we are Peruvians. Mixture. 1001 Records is born in a context in which some local artists influenced by technology and the concept of global village decide to start telling what is going on in this part of the world. Not how it could be but how it is. And it is this attitude of self-acceptance that leads to an internal revolution, and probably later an external revolution. In 1001

50 After Mision Oroya was released, a call for woks for a new compilation has reached the Internet.

> Records we made audio, video, and programming with technology from the developed world and breathing the air of the underdeveloped world, which is already an addition to the history of contemporary humans.[51]

The label released the works of Theremyn 4 and 5 Esquinas (as well as distributing the first records of my project El Lazo Invisible). Both projects included in their sound elements and notions of Peruvian culture from both traditional and urban settings.[52] While 1001 Records had a short existence as a record label, its initial work is important to attest for the initiation of a culture for popular electronic music that wanted to claim its Peruvian status as an important part for its musical output. While the Peruvian attributed where not clearly defined the intention was present.

A project difficult to position within the scene of electronic music in Peru is Jardin Vertigo (different from the project Jardin we will talk about later). While this project of Marco Rivera did not participated much publicly and was not related to any particular scene, its one of the earliest experimentations with sample and tape collage during the 1990's.

The now almost standard glitch and error cultures also found a niche for Peruvian musicians. From the initial term of IDM (Intelligent Dance Music) to the idea of Minimal Techno and all the way into the collage of errors, Peruvian laptop performers could get away from the dance floor, a problem common to many Latin-American scenes. Projects like Kollantez, Rapapay, Terumo, and Sacapunta showed an interest in a laptop culture for electronic music in Peru that maintained the rhythmic base and structure of previous electronic scenes even in its deconstruction; while others like Jardin, Paruro, Wilder Gonzales and Christian Galarreta went down the road of

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51 Jose Gallo, personal Interview, 16 July 2008.
52 I will discuss the specifics of this notion of 'Perúvianity' in the following section.

experimentation testing its extremes.

On the year 2000 and important event took place in the Central park of the Miraflores neighborhood in Lima: Modular 12° 06' / 77° 01' or Park-O-Bahn. A festival of 168 hours of uninterrupted sound in a public space that included 12 important projects of the musical electronic scene, most of them already mentioned in this work. This important event has helpful in acknowledging the presence of electronic musicians, as well as the Guiness-like logic of breaking a record: "... I am sure that in no other part of the world a public space has been 'sonorized' for 168 continuous hours, an absolute record".[53]

Another historical event for the Peruvian community is the organization by Juan Carlos Barandearan and the Centro Cultural de España in Lima in 2003 of the first Festival de Música Electrónica Contacto. This is, as far as I know, the first attempt to reunite most of the representatives of the Peruvian scene. This festival also served to make the existence of a community of non-academic electronic musicians official and to allow them access to venues normally reserved, at the time, to both the academic and professional musician or what was considered the completely opposite end, that of vernacular or folkloric music. Popular electronic musicians were living in a middle ground, not traditional or popular enough for the museums or the educational circuits, and not academic or intellectual enough for the concert hall. This first version of the festival brought together the works of many of the projects we are mentioning throughout this work, who participated by presenting their music in live concerts for a sitting audience and by the release of a track in a double CD compilation that was

53 Jose Javier Castro, "Park-O-Bahn," Peru/Video/Arte/Electronico. Memorias del Festival Internacional de video/arte/electrónica.2003. Alta Tecnología Andina [ATA] and Instituto de Investigaciones Museológicas y Artísticas [IIMA] de la Universidad Ricardo Palma, 83, http://www.ata.org.pe/pdf/libro/1-7.pdf

included as part of the next important festival organized by Barandearan as a follow up for his festival: 1er Festival Iberoamericano de Música Electrónica Contacto 2004. This second version of the festival included Peruvian and Ibero-American exponents of both academic and popular electronic music. I believe this last festival to be an important moment for the confrontation between the popular and academic discources for musical interpretation, While many popular musicians (Murcof, Yopoman, El Lazo Invisible, etc.) understood a need for a 'live' presentation to include real time processing on stage, many of the academic musicians (Flo Meneses, Edgar Valcarcel, Nilo Velarde, etc.) we more comfortable with the playback of previously recorded pieces.

Another example of the closeness between different styles in the small Peruvian scene was my experience in the organization of the Festival de Musica Electrónica y Artes Visuales in 2005 at the Universidad Mayor de San Marcos en Lima, that included the participation of Colores en Espiral, Sonoradio, Sacapunta, Rapapay, Jardin, and El Lazo Invisible. These projects represented at the time the wide variety of Peruvian experimentation. The presence of a table promoting the work of projects like El Conejo de Gaia from the important independent label Superstar Records and Christian Galarreta from the collective Aloardi show a small panorama of the musical scene in Peru at the time.

Figure4: musicians participating at Festival de Musica Electrónica y Artes Visuales (2005)

The Aloardi collective deserves a particular mention in this process of Peruvian experimentation with technology. This group of artists lead by Christian Gallarreta has produced not only musical results by releasing several records of Peruvian experimental artists but organized the latest edition of the Contacto festival in 2008. While it is true that the festival lost by being organized exclusively by one particular collective and by making its central exhibition the work of only this particular collective, leaving many members of the community outside, it is also true that an exhibition of this level of all the work done by Aloardi in recent years was long overdue. This last version of the festival, known as Contacto 2008: Chicha con Limonada, attempted to put together a representation of contemporary popular culture in Peru: in their words, "a variety of proposals that have adapted expressions and technologies belonging to urban contexts to their own language, going from the popular music with traditional roots, to electronic music, to experimental music, hip-hop anti-establishment, and the music

made by street artists."[54] This collective's notion of political activism is essential to their representation of Peruvian popular culture. A defense of the marginal and informal as well as an opposition against the official system and the establishment, common to many Peruvians, is explicitly present in their discourse. The defense of software piracy and a sensation of being exiled from a social system controlled by forces alien to their own networking systems and mechanisms for survival are characteristics common to many Peruvian artists but not necessarily mentioned directly as in the case of Aloardi's political manifestos.

The last years have seen a proliferation of musical projects interested in the aesthetics of error, low-fi technological applications for music and the use of sensors for musical performance. Gabriel Castillo Agüero, Paola Torres Nuñes del Prado, and Rolando Polo are just a few of the many practitioners of a culture of sound arts in the making.

2.5 Bricherismo Musical: Peruvian World Music

The politics of musical appropriation as a means to demonstrate respect and admiration for musical traditions leave us always with problematic and unanswered questions regarding ownership, control, power and domination. The contemporary mixtures of local musical elements with global (mainly Western) musical ideas that has left us with terms like 'world music' or 'world beat', range from the interesting innovation that fosters even more creative outputs for a community (sometimes an artistic outlet to musical worlds that have become inactive), to the political control over traditional musical systems for the benefit of those in control of the means of production. Those

54 http://aloardicontacto2008.wordpress.com/

artists seeking participation and success in the international marketplace feel an obligation to gain control over the traditions and nationalities they represent. A commercially successful album can allow an artist to make a claim of ownership. The political situation of Peru and the systems of social segregation and racism that have been lately dissipating but are still in place make it also possible for musicians to work on markets of internal tourism, were the urban population of Lima, for instance, can have a kind of 'bipolar' notion of alien/member towards the indigenous traditions of Peru. Micky Gonzales' Inkaterra 'etnotronic' project and Jaime Cuadra Cholo Soy: Peruvian Waltz Chillout are the best current Peruvian examples of internal musical tourism for the electronic scene of Peru, and deserve further attention in future works.

The Peruvian manifestations of world music and the initial hybrid musical products that intended to mix electronic music with Peruvian musical elements lead us to a problematic questioning. Problematic, at least for this work, in the sense that it leads us to the task of attempting to define the nature of a musical product not only by its musical qualities but also by its social and political implications, and its commercial intentions.

In any case the resulting music was not obtained by the experimentation with technology and musical construction but from a well-defined commercial interest in generating Peruvian variations to already successful global musical movements.

The Peruvian projects we will discuss in this section are those more concerned with experimenting musically for the widening musical horizons, than with the generation of markets for musical consumption. We will discuss here those projects with ‘underground’ political preferences for their musical practices and those of an independent non-mediated or at least self-mediated nature. These projects are only tangentially related to the repercussion of "world music" or "world beat" in

contemporary musical culture, while their historical moment undoubtedly connects them to the term and to a snowball of nationalistic attempts to generate Latin-American electronic music that started at the end of the 1990s, and found its way to Peru in the last decade.

During my visit to Peru in 2001, looking nostalgically for a way to present my own musical experimentation to the place were I considered it was important, the place were I grow up, I encountered the work of 1001 Records and organized a couple of presentations with the projects Theremin 4 and 5 Esquinas. This initial conversation included the presentation of the first electronic fusion track in Peru, my nostalgic Te Amo Peru[55] that included samples of Chabuca Granda (a famous traditional Peruvian singer of Criollo waltzes) and my listening of the track Chambi[56] by Theremin 4 (in honor to the famous Peruvian photographer Martin Chambi de Coaza) that included a sample tempo matching between the track's rhythmic base and a traditional huaino. It was not until sometime later that I discovered the existence of the project Kollantez, a work that had been including the fabrication of digital musical using samples and rhythms from the Afro Peruvian popular music tradition. One example of his experimentation was included (under the artist's name: Jhonny Collantes) in the important compilation CD release after the 2004 Contacto festival. Kollantes, like many of the other projects of the Peruvian scene I have mentioned in prior sections, fells a dislike with musical projects interested in marketing strategies and commercial benefit. As the project's myspace proclaims: "no trance, no house, no cheap products that you can find anywhere, no flag-bearers of electronica, no DJs, no producers, only music".[57]

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55 El Lazo Invisible, Canciones Para Manejar, Taller Cuerda Floja/1001 Records.
56 Theremyn 4, Fluorescente Verde en el Patio, 1001 Records.
57 http://www.myspace.com/kollantes

More abstract attempts to represent a Peruvian reality musically, and not related to World Music, include the project La Combi, presented by the project Jardin on the second edition of the Con-Tacto festival in 2004 (the first and only international version so far). Jardin tried to represent musically the feeling of participation in popular transportation in Peru, as exemplified by the Combi, a cuasi-informal system that invaded the streets of Lima and represent for many the sense of disorder and chaos present in a city that has grown at a speed impossible for the government to keep up with. The Combi, a small van designed for family use and transformed to sit more people than possible, has become a symbol of Lima's fragmented and hybrid culture, and an example of the invasion of popular and provincial logics into the city. The Combi and its predecessor the Microbus have become a center for urban Peruvian identity because of their essential roll in social networking, as Matos Mar stated in the 1980s: "A new actor characterizes the labyrinthine circulation: the microbus. The routes get longer, get complicated and finish in an unending labyrinth. The streets and avenues get strangled by the strong congestion at the moments when the overwhelming public and private bureaucracy start and finish their shifts."[58]

2.6 Don't worry I'll Do it Myself

Somewhere around 2001 I bought in Lima my first Peruvian home made tone generator, an impressive 5 oscillators machine that was invading the electronic scene by the hand of Carlos Garcia (a.k.a. Carlangas or Zetangas). Carlos was constructing in his room sound producing machines by recycling parts from old circuits bought in Paruro, a kind of parts cemetery market in the street of the same name in Downtown

58 Jose Matos Mar, Desborde Popular y Crisis del Estado. Veinte Años Despues , 87.

Lima. Curious musicians were attempting to use these machines for live performances (and still do). The image made sense, and the recycling nature of Carlos' Zebranalogics informal company, fit the nature of a Peruvian scene that needed to find alternatives to keeping up with the race for buying impossibly expensive synthesizers. It was impossible for most Peruvians to maintain a sound aesthetic based on the new developments by the international companies producing synthesizers. I copy here part of the last statement by Zebranalogics. It includes helpful information to clarify the intentions of the project:

> Zebranalogic, born in Lima Peru at the middle of 2003 with the idea of producing handmade musical artefacts, working with recyclable material and also factory production material. Zebranalogic focuses on the construction of oscillators well as guitar effects. Now zebranalogic has moved to Stockholm Sweden. Something that has given it more strength and vitality to continue on its path. I, Carlos Garcia, creator of zebranalogic, have done all this for my love to music, because I love the idea of having an instrument, modified, recycled and re-invented, considering all the formulas to make it. Because as we know this is a world where nothing is invented, but everything can be reinvented. Because of this zebranalogic takes a pattern of life and takes this concept not for money, fame or to sell billions but with the idea of making music cooperation.[59]

Not so long ago, an in an obvious continuation of the aesthetics of Zebranalogics, Alfredo Aliaga has continue with the work started by Carlos Garcia by building a series of machines dedicated to music production: the Eclipse, the Medusa, the Mochika. This new machines have included new options like photocell control over sound parameters, sequencers and synchronization.

Both Carlos Garcia and Alfredo Aliaga mention monetary issues as an essential reason for their home factories. When asked for the reasons behind his work Garcia's

59 http://zebranalogiclabs.blogspot.com/

says that "it was the easiest way for [him] to make money[60]". While the musical interest and participation of Carlos Garcia in different musical projects gives us a more complete notion of his interests, when looking at his production he sees it as a means to make the money he needed. When Aliaga explains the origins of his work he says: "I wanted a synthesizer, to play, but I was broke. I tried to find money, find work, find a used one, I tried everything but it was too expensive, A MicroKorg was $700, and there were no used ones - well it was a disaster. So I said to hell with it, and built my own[61]".

Again the problematic of having to fulfill a role for the foreign spectator taint the information making it hard for us to define if this immediate interest in money is real or there is an interest in selling the idea of an environment lacking resources and economically impaired to maintain the general mythology of the developing countries. A product whose culmination requires the bridging of almost insurmountable obstacles becomes an exotic object of admiration and an expensive commodity. While the initial machines built by these artists were accessible for regular Peruvian, the growing foreign customer that made Aliaga include English texts in the Internet explanation for his products and the moving of Carlos Garcia to Europe might make these originally home made products not affordable anymore for the electronic experimental musician of Peru. This situation defends the idea of multiplying the options by getting musicians to built their own tools and not depend on somebody else's knowledge, even if it is local and independent.

60 Carlos Garcia, personal interview, June 1st 2008.
61 http://www.atomolabs.blogspot.com/

Figue 5: New Oscillator VIII by Carlos Garcia.

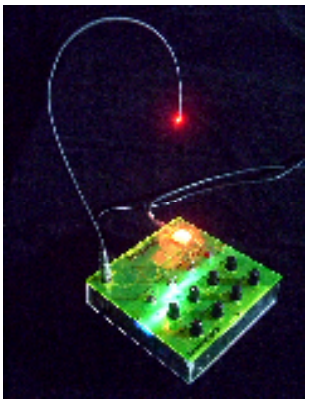

Figure 6: 'Abyssal' analog photo-noise-machine by Alfredo Aliaga

Chapter 3

Peruvian Values / Musical Output

The philosophical idea that there are no
more distances, that we are all just one world, that we are all brothers,
is such a drag! I like differences
Brian Eno

Todos los Perúanos debemos jugar por el equipo de la casaquilla bicolor
Juan Velasco Alvarado

On my way back from Peru after a research trip for this work I was reading the airplane magazine and on the beauty section I found the following statement: "Scent is like one's ringtone, a series of notes that artfully expresses its user".[62] It is a popular notion that technology or at least technology based consumer products can be customized to represent us, to modify their image and its output to give meaningful information about a person's identity. There is also, in the case of music, the more complex idea that certain musical combinations and characteristics are representative of a person, a social group, an ethnicity, a country, a region, etc. A series of musical instruments and interfaces can be made to speak the language we select to identify ourselves, no matter how limited the options and parameters of control. In the case of

62 American Way, April 15th 2008, 16.

electronic music the constrains are bigger and while synthesizers and samplers have multiply the sound options, most electronic musical cultures seem to have very strict aesthetical rules and are not interested in the control available in most commercial synthesizers and rely in pre-defined parameters. This strong 'preset' culture for electronic music is in part the result of the nature of the new instruments. Stand alone synthesizers, computer based virtual synthesizer machines and sequencers have simplify music production to the extent of allowing anyone regardless of their musical knowledge to generate musical products for a public.

3.1 Political situation

However influenced by its limitations Lima's popular electronic communities have developed musical systems that define them and that represent the problematics and conditions of the country, an in this case the capital city. Lima, as the center of confluence of the different subcultures of the country, and the center for the construction of the hybrid and fragmented culture that is in the process of forming a Peruvian identity; is the study case of this paper. We will try in this part of the work to define a list of characteristics and values that are present in the communities we mention. I will take under consideration essential elements of the contemporary socio-historical process and, while a more extensive investigation about the connection between social tensions and struggles and how they translate into art products in necessary, a basic mentioning of political conflicts and their repercussion is made.

Electronic experimental music of Peru has a high political content whether this content is explicit or not. A romantic post-socialist aura surrounds many of the activities of the scene we analyze, and social reflection and consciousness are essential element for its claim for independence and identity. Many of my conversations and interviews

for this work have found musicians more interested in political critique and discussions about the conceptual arts and social situation than on musical details. The rise of International Socialism in 'modern' Peru, all the way from its application to Peruvian reality by Jose Carlos Mariategui on the 1920s, the socialist government of Velasco Alvarado during the 1970s, the soft socialist attempts by the APRA party during the 1980s, and the emerging of Marxist based terrorism with its toll of violence and death for more than two decades; has left Peruvians with a sense for a need for social participation and awareness. What Theodor W. Adorno might have considered as an ineffective and doubtful quality of contemporary works of art is an essential element for the musical world we discuss: a socially conscious art that deliberately attempts to make a statement, sometimes veiled, about social conditions, trough its artistic world. This political awareness, however, comes together with a lack of confidence on political systems and a sense of despair about the future possibilities of the country in the political militant arena. When asked, many musicians would reject the idea of being politically inclined to avoid being identified with any political movement or position. Lack of knowledge of particular political issues was considered a sign of alienation from reality and unpatriotic. Since the 1990s government of Alberto Fujimori this political interest has been slowly declining due to economical progress and stability.

For a long time the analysis and discussion of the internal differences inside popular Peruvian culture have been based on racial issues. At the time the first big wave of migration to Lima took place in the 1940s the racial differences were essential and the word 'Mestizo' an important term to explain the racial, and by extension, cultural mixing produced in the capital by the arrival of sectors of the population that for centuries had been disconnected from decision making and the development and

application of modernity to the country. The capital had served as the main bridge between Peru and the rest of the world. Nestor Garcia Canclini on Hybrid Cultures and Communicative Strategies concluded about his coining of the term hybridisation as a social concept that he "found this term better suited for grasping diverse intercultural mixtures than 'mestizaje', which is limited to racial mixing"[63]. However, is still common for contemporary authors to maintain the logic of racial opposition and confrontation to explain Peruvian popular culture. For instance Juan Carlos Vera in his book Conversiones Culturales en el Peru says that "The image that characterizes the notion of the social in contemporary Peru is that of the popular, an image with a 'mestizo' face and with hybrid customs, this is to say, with indigenous lines of expression, whether this are physical or cultural"[64]. However unrelated racial conflict might seems to our current discussion, it has shaped the different levels of communication and the social hierarchies of musical participation for the alternative musical scenes we mention. The extend of the migration to Lima during the 20th century changed dramatically the notion of Lima as a 'garden city', a beautiful and elitist colonial city, to that of 'Lima the horrible' a disorganized and out of control urban mess[65]. This unregulated migration is also responsible for the invasion of folkloric or provincial musical traditions and reduction of spaces for traditional coastal educated music. "The number and diversity of folkloric programs in the radio stations has not ceased to grow since the beginning of 1950s ... [while] coastal popular music and creole, had not been able to go over the

63 Néstor García Canclini, "Hybrid Cultures and Communicative Strategies," in Communication for Social Change Anthology, ed. Alfonso Gumucio Dagron and Thomas Tufte (New Jersey: CFSC Consortium, Inc., 2006), 370.

64 Juan Carlos Vela, Conversiones Culturales en el Peru (Editorial Mesa Redonda: Lima, 2007), 45.

65 Ibid, 45-46.

12 to 15 hours of daily radio air"[66].

It becomes difficult to talk about musical cultures of Peru that have not been able to develop their own hybrid manifestations. In the contemporary situation of Lima, and its new connections with the rest of the country thanks to migration, "Andean music evolves and gets urbanized. Adopting modern technology and taking advantage of it as a personal instrument that takes the multiple forms of local folklore, fusions, recreate and spread them, returning to the mountains a new national folklore"[67]. Electronic popular music has still to develop its own systems of cultural appropriation beyond the imitation of culturally alien musical movements and aesthetics. While attempts discussed in the prior section, like Peruvian manifestations of World Music and experimental sounds based on Peruvian social contexts, have been made; they are still based on global systems of cultural mutilation or exclusion that keep musicians from developing their own options. The strength of non-academic but well informed coastal electronic popular music is still relying and waiting for foreign acknowledging and approval. Many experimental musicians wait for the next system of strategies to get imported and hope to declare as their own sound experimentation that they could declare uncommon to population that is not informed of certain traditions because of the obvious: they have not existed in the country.

Only time will be able to tell us how the strong influence of powerful of the new popular sectors of Lima will help generate variations on the electronic music culture of the city. The new generations of migrants have modified the cultural scope of of the country and have imported and revitalized, in a urban setting that they have

66 Jose Matos Mar, Desborde Popular y Crisis del Estado. Veinte Años Despues (Lima: Fondo Editorial del Congreso del Peru, 2004), 83.

67 Ibid, 83.

organically and unofficially developed for Lima, traditional and ancient strategies. A development of national pride during the last ten years has allowed 'cosmopolitan' and modern Lima to look inwards in the search for an identity. Both traditional Lima and contemporary Lima are constantly pushing to appeal to each other. Both Limas are in the process of learning each other's language and blurring their borders. The current need to include stereotypical signs of an already fabricated 'Peruvian' culture is a good sign of the possible development of a negotiated culture in which the traditional groups borrow and learn from each other by their forced interaction. Cultural borders maintained for centuries in Peru are about to collapse, and soon regional particularities will give room for a multiplicity of urban manifestations that we will call Peruvian with more rights than before.

3.2 Centralization

The problem of centralization in the capital and lack of economical incentives for the other regions of the country has produced in the last decade the promulgation of laws like the Ley de Bases de la descentralización[68], committees like the Comisión de Regionalización y Descentralización, and the publication of important books like Regiones Integradas[69] (published by the Peruvian Congress). Many attempts have been made since the independence of Peru in 1821 to decentralize the power from the capital without any success as Gerd Schönwälder has disscussed.[70] Two attempts

68 Congreso de la República del Perú, Ley de Bases de la Descentralización. Ley N° 27783, July 17, 2002.

69 Efraín Gonzáles de Olarte, Regiones Integradas (Lima: Fondo Editorial del Congreso, 2003).

70 Gerd Schönwälder, Linking Civil Society and the State: Urban Popular Movements, the Left, and Local Government in Peru, 1980–1992 (Pennsylvania: Pennsylvania State University Press, 2004), 94.

to organize the country by autonomous regions, one in 1979 an another one in 1989, failed to be implemented. As explained by Kathleen O'Neill:

> The Peruvian cases dramatically illustrate how political fortunes shape power-sharing arrangements between central and subnational governments. Between 1978 and 2000, power was decentralized to local governments in paper, decentralization promises were converted into practice, decentralization to regions was attempted but not fully adopted, and, finally, power was substantially recentralized.[71]

It was not until 2002 that the law we have mentioned was able to divide control into independent local governments. However six years is not enough to produce the integration of the country and generate economical incentives that can attract the population to stay in or migrate to specific regions, or convince the migrant population that has made a living and a family in Lima to return to their traditional homes.

The new population of Lima, after many years of constant migration from other parts of the country, has now become, in its own right, the center of the country and an accurate representation of the multiplicity of cultural options the country has to offer. Already by 1986 Hernando de Soto considered that "in the period between World War II and today, Peru had experienced the deepest change of its republican history".[72] What is defined as popular culture in Peru is represented by a hybrid mixture of a capital city in a constant process of reorganization and adaptation. Most authors agree that the process of evolution of popular culture in Lima is the result of a violent confrontation between popular forces and official forces.[73] Jose Matos Mar in 1984 describes the situation of Peru as a popular overflow:

> One of the fundamental processes that configure the actual situation of

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71 Kathleen O'Neill, Decentralizing the State: Elections, Parties, and Local Power in the Andes (Cambridge: Cambridge University Press, 2005), 189.

72 Hernando De Soto, El Otro Sendero (Bogotá: Instituto Libertad y Democracia, 1986), 3.

73 Matos Mar, Desborde Popular y Crisis del Estado. Veinte Años Despues, 19.

> Peru is the growing acceleration of an unusual dynamic that affects all the social, political, economical and cultural structure. Is a case of an overflow, in all dimensions, of the institutional standards that direct society, and over which the republic has rotated since its creation.[74]

3.3 Problems of Accessibility: (Plan Inca and Informal Economy)

Most products used to generate electronic music by popular and untrained Peruvian musicians are 'close' systems that not allow access and are not designed for experimentation. This is especially true, as we have mentioned before, about the affordable products many musicians in Peru can and have used for music since the 1980s, like the Casiotone and Porta Tone keyboard series. Having for instance the same kind of keyboard used by a great number of musicians difficult the possibilities for different musical outputs. It can be consider that while on one hand musical instruments with fewer options produce a less diverse musical scene; on the other hand they become an option for a creative use of the tools. While in the last decade we have seen a drastic reconfiguration on the traditional systems for accessing information and the social methods for connecting with musical scenes worldwide have been democratized by the Internet; we must understand that this process is relatively new in Peru. The initial manifestations in the history of popular electronic music in Peru did not count with these tools and the first generation was directly dependent on access to foreign products and imports. The, maybe arbitrary, decisions taken of importing a product instead of another might have had an influence on the early Peruvian scene. While a musical videoclip or a CD could travel the world an present a sound, the machine that produced it could not be obtained.

Accessing and producing music are to different problems to be resolved by the

74 Matos Mar, Desborde Popular y Crisis del Estado. Veinte Años Despues,17.

Peruvian musician. During the first years of the new wave influenced Synth Pop Peruvian scene, accessing music implied expend an impossible 20 dollars at specialize stores like Music Nice and Megadiscos and wait for about 20 days for the imported product to show up at the store. Most likely being imported by airline personal that was bringing the records as personal items to avoid having to pay for customs. The alternative option, and this represents an important response to the need to access information, was the recording of cassettes tapes. Stores like Grabaciones Accidentales or Soundmixer were the first ones in promoting the distribution of customized illegal copies on cassette tapes. These "recording stores were the salvation for many young adolescents hungry to obtain all the groups of the New Wave nad Dark scenes."[75] Musical trade belonged definitely to an underground and informal circuit. Foreign records were sold on the streets and information about recording stores passed mouth to mouth. Other systems included the selling of these recorded tapes in the high schools. A list and a tape would be picked up at the end of the school day outside the schools and returned recorded the next day. These mechanisms of accessing media products and goods are not unique to music and are part of a larger system in place in Peru as a result of the migration: informal economy. The more people migrated to Lima and as 'its public urban space was becoming informal, other economical activities started to suffer a equivalent evolution."[76] The systems for spreading music commercially that we can mentioned are just 'elegant' variations of the comercio ambulatorio (street informal commerce) in both of its variations, itinerant and with fixed location; and the popular informal markets built specifically to fight the

75 Eduardo Lenti, "Tiendas de Discos y de Grabaciones," Historia de la Escena Limeña: Años Ochenta, http://limaochentas.blogspot.com/2007/12/tiendas-de-discos-y-de-grabaciones.html

76 Hernando De Soto, El Otro Sendero, 66.

urban chaos produced by this street commence. Just as an example of the effectiveness of these alternative systems of distribution, we can say that many of the books used for this chapter are of suspicious origin.

In develop countries the argument for democratization of intellectual property is a conceptual and political position and not related directly to personal need, and contemporary organizations like Le Parti Pirate from France and the Swedish Bureau of Privacy are interesting in making their political visions heard. Of course, new contemporary art collectives in Peru have echoed this conceptual fight by making official statements regarding piracy policies and against the institutions claiming to defend intellectual property.

INDECOPI, the National Institute of Defense of Competition and Protection of Intellectual Property, would try to make a case for "becoming conscious and making sensitive the people about the damage caused by piracy to the local industry and to the country image in front of the international community, a fact that results in the country development"[77], and the International Intellectual Property Alliance stated in its 2005 Special 301 report in Peru that:

> Piracy of sound recordings in Peru is an especially severe problem. In 2004, the estimated piracy level was an astronomical 98%, one of the highest music piracy rates in the world, resulting in the near total collapsed of the legitimate recording industry in that country. In fact, Sony Music and Warner Music essentially closed operations during 2004. Pirate audio product in Peru appears in all formats—cassettes, CDs and now mostly CD-Rs (recordable CDs). Thousands of pirated audiocassettes and illegal music CDs are sold in the neighborhood of Mesa Redonda, located one block away from the police and Public Ministry's headquarters. Customs figures have indicated that there were more than ten blank CD-Rs legally imported into the country for every

77 OMC Abogados & Consultores E.I.R.L. Patent and Trademark Attorneys, "Indecopi Destroyed Hundred of Thousands of pirate Disks Seized in Several Raids in the Last Months," On Bulleting August 2007, http://www.omcabogados.com.pe/boletinagosto2007/index.html

> single CD sold. Thousands of blank tapes and CD-Rs are smuggled into the country through Tacna in Chile (Iquique-Arica) each week and then distributed for illegal duplication around the country. COPERF, the Peruvian Recording Industry Association, continues to run an anti-piracy campaign which results in some police raids and the seizures of pirate product. However, these isolated actions are not sufficient to serve as real deterrents against piracy, or to restore the market.[78]

In order to protect the economical interests of the mainstream and traditional recording industry, organizations like IFPI go to the extreme of attempting to propagate the notion that piracy in general is directly connected to organized crime and even terrorism,[79] without an analysis of the social conditions that surround it. The problem is not simple; a regular Peruvian only has the option of forming part of "another mafia"[80], one that makes products affordable and accessible. As the Aloardi sound arts collective points out, for many Peruvians "...the selling of original software sounds like a crime in a place were a complete package of any operating system costs more that the official salary of a regular Person."[81] In any case, for the culture of our interest, the community of electronic experimental musicians, the subject is relatively irrelevant in a daily basis, none of the members of the community rely on the musical industry for the distribution of their work. Their systems of distribution feel more comfortable around the pirate networking because of the commercial quality of their product and the informality that surrounds it. It is easier for their product to be sitting right next to a pirate copy than in an official music store, since at this point (and since the 1970s) there is no

78 International Intellectual Property Alliance, "2005 Special 301 Report Peru," Special 301, http://www.iipa.com/rbc/2005/2005SPEC301PERU.pdf.

79 See: International Federation of the Phonographic Industry, "La Pirateria Musical, el Crimer Organizado y el Terrorismo," http://www.ifpi.org/content/library/music-piracy-organised-crime-spanish.pdf.

80 Carlos Bellatin Ramos, "El problema de la Pirateria," Revista Cultural Participativa Encontrarte, Year 4, http://encontrarte.aporrea.org/media/15/Pirateria.pdf

81 http://www.aloardi.net/concepto.htm

Peruvian industry to support local artists not participating in 'commercial' music or popular folklore.

The Peruvian youngster of the 1980s simply had no option but to replicate and obtain sound according to his/her means. Owning an original record was a symbol of status and an obsession with the actual object and somehow unrelated to the sound. We are talking about a generation that grew up during the process of returning to democracy after 18 years of military governments (1968-1980). The socialist driven military government of Juan Velasco Alvarado was devoted to the creation of a national pride in the population and defended an "anti-imperialistic position; rejecting any attempts for foreign intervention; and assumed a militant position against all forms of external dominance ..."[82] The 'Revolutionary Government of the Armed Forces', as it was designated officially, regulated closely foreign investment and international trade. The Leftist notions of this government, that later declared not to be capitalistic or Marxist, "invoked the full recovery and protection of rural, 'native' culture as a bulwark against the onslaught of urban, "foreign" culture (that is, culture linked to capitalist consumption).[83] Velasco's political plan of looking inwards and his creation of a "considerable budget for the advancement and rescue of indigenous culture"[84] helped in the development of Peruvian folklore, Andean, 'criollo' and afro-Peruvian

82 Luis Domínguez Romero, "Nacionalismo y Militarismo en el Perú: 1968-1980," OMNIA IV Congreso Nacional de Estudios de Posgrado Revista de la Coordinación General de Estudios de Posgrado, Año 5. Número 16. septiembre -1989, Universidad Nacional Autónoma de México.

83 Deborah Pacini Hernandez, Héctor Fernández-L'Hoeste, and Eric Zolov, "Mapping Rock Music Cultures across the Americas," on Rockin' Las Américas The Global Politics of Rock in Latin/o America, University of Pittsburgh Press, Pittsburgh, 2004,11.

84 Martha Ojeda, "Introducción a Nicomedes Santa Cruz: ecos de África en Perú," Ciberayllu, July 10, 2008, http://www.andes.missouri.edu/andes/Comentario/MO_Nicomedes.html.

musical styles. Velasco went to the extent of asking Agusto Polo Campos, one of the most important 'criollo' composers, to create a song that would encourage patriotism. Polo Campos created "Y se llama Peru" (It's called Peru) at his request and years later the Peruvian waltz "Contigo Peru" (with you Peru), by request of Augusto Vinatea, a member of the next military government[85].

For the sectors of the population living in Lima at the moment of Velasco's revolution, and more connected to foreign music that to the traditional musical styles of the country, Velasco represented censorship and a sudden stop in the evolution of Peruvian rock, getting to the extent of declaring that "Velasco was who killed Lennon"[86]. In 1969 the government canceled the 'matinales' were most rock groups presented their work and two years later The Instituto Nacional de Cultura (National Institute of Culture) created by Velasco on that year declared oficially that "rock was not culture" The cancelation of Carlos Santana's concert by the government is consider as a symbolic moment for his period of isolation from the international rock scene. Is not until the return of democracy in 1980 that rock starts to flourish again. while never returning to its initial strength.

The history of popular music in Peru is directly connected with the political situation. Velasco's government can help us understand how, paradoxically, his vision of foreign pop culture as a system of alienation for young Peruvian has produced new generations of politically charged musical outputs but based on the same musical traditions he rejected. As a natural process of hybridization Andean has become influenced by technology and foreign styles while rock and electronic music have

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85 Dario Mejia, "Contigo Perú," Peruan-ità, www.Perúan-ita.org/personaggi/dario/contigoperù.htm.

86 Mancho, "Inicios del Rock Peruano," Confesiones del Tiempo, http://manxo.blogspot.com/2007/08/inicios-del-rock-peruano.html

developed new Peruvian languages to express themselves. Most of the Peruvian musicians working on electronic experimental music at this time have inherited through the educational system of the Revolutionary Government of the Armed Forces a disdain for commercial objectives on musical production. Velasco's government considered, as reflected in his Inca Plan[87] for Peru, that "the educational system was intentionally oriented towards maintaining in a state of ignorance the majority of the population for the purpose of exploitation" and that "telecommunications [were for the most part] in the hands of foreign companies"[88]. The educational reform hit the traditional schools of Peru with highly politicized agendas that were to affect both the access of foreign information and the reception of that information. At the time of Velasco's revolution the dominant classes of Lima, the same classes that were resisting the reform, considered Peruvian folklore as 'inferior' musical styles that represented the indigenous and ignorant sectors of the population. No school student of Peru belonging to the high classes in control of the economy and politics would listen to these styles or, for that matter, anything that was not foreign, this is at least until 1968.

3.4 Value System

The generation of a tentative value system for the Peruvian scenes discussed in this work is based in a) autoethnograpic results of my participation in the experimental electronic Peruvian world during the last 10 years, b) personal interviews and informal conversations with members of this community, c) a conference organized specially for

87 The Plan Inca was the official plan for Peru proposed by Velasco´s government in 1968.

88 El Proceso Peruano, editada por la Subdirección de Publicaciones y Material Educativo del Instituto Nacional de Investigación y desarrollo de la Educación "Augusto Salazar Bondy", INIDE-MINISTERIO DE EDUCACIÓN. Lima-Peru.

this work, and d) methodological tools from different areas of the humanities.

In order to gain relevant information, a conference was held at the Sonoteca of the Centro Fundación Telefónica in Lima on April 24th 2008, under the title: Estrategias y Características de la Música Experimental Electrónica Limeña. On this conference, three sound artists representative of Lima's electronic experimental scene discussed what they considered could be strategies or characteristics present in the mind of the experimental electronic sound artist of Lima and how they affect their practical and aesthetic decisions. I have also taken under consideration my own experiences in Peru and personal communications with different sound artists from Lima. The following discusses my attempt to integrate these notions into an initial set of 'values' that could correspond to our 'Peruvian' identity as musicians.

Figure7: Conference at the Centro Fundación Telefónica (2008).

3.4.1 Informality

One of the most important books of contemporary Peruvian history about the

situation in the country, an the economic effect of indigenous migration on urban development, is El Otro Sendero: La revolucion Informal by Hernando de Soto. It compiles the results of the studies of the Instituto Libertad y Democracia regarding Informal Economy in Peru. As the book states: "People have gradually grown used to living outside the law. Theft, illegal seizure, and factory takeovers have become everyday occurrences and do not greatly disturb people's consciences. Thanks to constant whitewashing, some criminals have become public figures.

A complete subversion of means and ends has turned the life of Peruvian society upside down, to the point that there are acts which, although officially criminal, are no longer condemned by the collective consciousness. Smuggling is a case in point. Everyone, from the aristocratic lady to the humblest man, acquires smuggled goods. No one has any scruples about it; on the contrary, it is viewed as a kind of challenge to individual ingenuity or as revenge against the state."[89]

While not all informal activities can be consider as criminal or illegal, they are definitely outside of the realm of the official system and are uninterested in Interest in social issues is accompanied by a lack of confidence in official institutions and in the capability of the government to resolve their problems. Peruvians define their needs based both in the reality of their situation outside of the legal/official system and by their possibilities to subvert this system through alternative systems of social and economical networking. In this self regulating economy music and software piracy have become highly popular but musical hardware imports has suffer since it requires a higher investment on part of the informal merchant.

89 Hernando De Soto, El Otro Sendero, 5.

3.4.2 Recursero

The dramatic political and economic crises of Peru have generated a population willing to adapt to any particular situation by the use of the means at hand.

As a result of long periods of political and economical turmoil, generations of Peruvian artists, find themselves unimpressed by the notion of consumption and expense. The shopping paradigms of some western countries are considered by many as wasteful and unnecessary. Some could argue that the political influence and educational reforms we have discussed before are also responsible for this disenchantment.

Peruvian colloquial language argues, through the use of specific terms, for an informal understanding of the processes involved in accessing goods. The Peruvian electronic artist is, for instance, 'recursero' (resourceful). This is to say that there is a willingness to adapt to a economical situation by taking advantage of the means at hand while finding a particular pleasure in reactivating old and unused instruments or finding musical use to apparently obsolete equipment. During the last decade there has been a strong revival of patriotic sentiment that forces artist to look at a superficial construction based on the stereotypes of Peruvian culture for their artistic output. Mentioning terms like 'recursero' or in its verb form, 'recursear' is now a common fashion marketing strategy not only for foreign tourism but also for internal tourism, this new boom of a fashion system defined by ideal deemed to represent the Peruvian population makes it difficult for us to define the cases that represent resourcefulness as a need and those project that rely in the conceptual notion as an image. At this point the case for electronic experimental music seems to be different. There is a direct relationship between most of the projects that apply this technique for their 'decisions' regarding hardware and musical output.

Projects like Jardin (formed by Raúl Gómez y Orlando "Litty" Ramírez) and Paruro (Danny Caballero) on the performance arena; and Carlos Garcia's (Carlangas) Zebranalogic hand made oscillator and effect production factory during the period living in Peru (he now resides in Sweden) are good examples of this resourcefulness.

During the 1980s the use of cheap equipment for the Synth-Pop community was not a matter of decisions but of options, but from the beginning of the 2000s certain shame on using these equipments had been lost. Jardin, one of the most influential projects of the last decade, started presenting its material by live improvisation with used equipment like the classic Casiotones, old drum machines, and guitar pedal effects. In other cases the performance would depend on newly acquired equipment which value would be tested on the fly. The use of tape machines for processing, live performance, recording and even for distribution (as is the case in their 2005 release Maqui de Hierro, distributed in cassette tape), is an example of their lack of interest for a professional image and quality.

3.4.3 Cachinero

The access to hardware for most electronic experimental musicians is define by the options presented by the informal markets, or by selling, buying and trading second hand goods (known as cachinear). Buying a new product from an official and regulated store is quite uncommon for the electronic musician. To cachinear implies a research process with normally unspecific results. It implies walking between different street markets with a general idea of the objects you are looking for but with the readiness to buy the available other. Musical variations in style for the Peruvian musician involved in technology might change dramatically depending in new found objects and even defective products. The 'aesthetics of failure' common to post-digital

musicians bored with their musical results and hoping for the machine to produce something more entertaining that what they could think of, have found an echo in some Peruvian musicians, who apply the logic of the aesthetics produced by a dysfunctional machine to generate a political statement. For instance the Aloardi sound collective states in its statement of purpose that "[i]n some ways, the acquisition of not well cracked pirate versions of operating systems, or incomplete versions, generate dysfunctions in the software. Taking advantage of this dysfunction and making it a technique generate a gorilla-like response against the formal and established product."[90] For the most part this notion of taking advantage of technological error is taken from a more superficial an apolitical one, presented, for instance, by Kim Cascone in his text "The Aesthetics of Failure"[91]. Aloardi's appropriation of this and other western ideas and aesthetics, include a definitely Peruvian political tint and the present of a social resentfulness common to many musicians and artists.

3.4.4 Resentfulness and Noise: Collective Depression

Social conflict, racial segregation, lack of access and civil participation in governmental processes, economical inequality, political chaos, terrorist violence, corruption, and a culture of political activism, are only some of the elements that have helped to generate a sense of social tension that is present in the community of electronic musicians of Peru. While not all musicians we mention are interested in particular actions to bring about social or cultural change, they have definitely well

90 http://www.aloardi.net/concepto.htm

91 Kim Cascone, "The Aesthetics of Failure: 'Post Digital' Tendencies in Contemporary Computer Music," Computer Music Journal 24(4) (winter, 2000): 12-18.

defined positions regarding social situations (whether they are openly political or not). In some cases a sense of craftivism is present by the notion of building the machines you use for live performances or at least organizing a performance set based on used equipment that gives you sound a sense of uniqueness. In other cases while the music is not particularly different or unique, the statements behind it or the graphic designs that accompany the work serve as a mean for social confrontation.

During the conference I organized for this work, these sentiments were made clear by some of the participants. While trying to define musical characteristics and strategies for their work, they would feel more comfortable with discussing social feeling and situations than talking about musical details. It got to the point where the public started to try to get answers regarding music only to be ignored. As one of the spectators rely to me later: "I believe that we Peruvians are so traumatized with everything that happens to us socially, that we are always talking about that to justify ourselves and our situation. We don't advance because of our racism. We don't advance because of the oppression. We keep talking about the pass instead of talking advantage of what we have."[92] It seems to be impossible for the popular electronic musician to avoid the social aspects and separate them from their work. Being completely ignorant about musical techniques could be completely understood and well, while superficiality and lack of political or social commitment could be criticized more harshly.

"'We're going through a national depression, a real psychic depression," statement in 1989 by Reynaldo Gubbins, then President of the Confederation of

92 Claudia Zevallos, personal interview.

Peruvian Industries[93] give us an idea of the social repercussions of a long period of crisis and uncertainty that has produced generations of resentful citizens without a clear notion of who to blame for their condition. Danny caballero's (Paruro) statements during the conference at the Sonoteca were very clear and honest regarding his social condition. "I am a resentful person" was one of his important remarks regarding his condition as a musician in Peru.

3.4.5 Self-Reliance and Alternatives to Consuming

We have discussed a little bit the culture of synthesizer and musical electronic instruments fabrication in Peru and given some examples of it. An aspect we have not mentioned is in what ways the Peruvian variation is different. As we have mentioned for other options taken by Peruvian musicians, the DIY culture of Peru is not initially based on a reactionary response to consumerism or a personal response to industrial and labor selective societies, but a practical response to social conditions. Most musicians of the Peruvian scene would act locally without thinking globally and would rely in the means at hand without being particularly interested in fighting mass-production or fight politically for options. No direct logic of boycotting companies or fight exploitation is present, at least in the DIY culture[94]. As we mentioned in our Peruvian home made synthesizers section, while the initial context that forced them to make their own products can be connected directly with social issues, they have no problem cashing

93 Alan Riding, "Peru Fights to overcome its Past," New York Times May 14th 1989.

94 The option of boycotting is present in some musicians from the scene. The Sonoteca of the Centro Fundación Telefónica has suffered an unofficial boycott by at least one musician that considers that the center does not treat Peruvian artists in the same way it treats foreigners when it comes to payment. This boycotting is highly selective and has only been applied to this organization as far as I know. Generally the community has supported both the Centro Fundación Telefónica and the Centro Cultural de España in their efforts to create spaces for Peruvian artists.

in on their home made productions to foreign musicians craving for exotic equipment made with the hands of 'the other'. For projects like Paruro the attempt to dismantled or use second hand equipment is an essential conceptual statement, and this 'almost done by yourself' recycling of equipment is more connected to an anti-consumer ideal. Jardin's multiplicity of second hand equipment and the setting up of alternative sets for different performances is also a conceptual variation of the DIY culture. New musicians like Gabriel Castillo also use lo-fi equipment for live improvisations, generating a visual notion of humbleness. It is possible that this variation of conceptual DIY (or built it yourself, or set it up yourself) have influenced some musicians in Peru not to use computers for their musical projects, leaving low-fi and used hardware as the only options available. This assumption requires further exploration.

Chapter 4

One Possible Interface for the Peruvian Context

4.1 The Interface is the Message

Ideas and innovations are vital elements on the growth of human groups. The development of a technological infrastructure and its concentration in specific geographical areas determines economical and social advancement of those particular regions. If "innovation is one of the keys to prosperity, then precisely how this happens – how a region breaks with convention and introduces new products- is a question of some significance."[95] While I are not interested in this work in the development of technological tools for economical development specifically, I argue for (1) the participation of the Peruvian population in the development of its own 'ideas' for the production of musical tools, and (2) the accommodation of these ideas to the particular situation of the country, an accommodation that can develop in a musical 'prosperity'.

Whether the tools being developed can be considered as an innovation or not, their existence is an essential step towards breaking the cultural boundaries of foreign exclusivity over sources of technical knowledge. Some authors consider that innovation is "increasingly dependent on a geographically defined infrastructure that is capable of mobilizing technical resources, knowledge, and other inputs essential for the

95 Maryann P. Feldman and Richard Florida, "The Geographic Sources of Innovation: Technological Infrastructure and Product Innovation in the United States," in Annals of the Association of American Geographers, Vol. 84, No. 2 (Jun., 1994), 210.

innovation process." I consider that the existence of adequate resources is important but not essential, and that the possibility of making decisions in the process of designing and constructing interfaces for musical purposes will favorably affect the musical output of the Peruvian community. Deconstructing, reconstructing and adapting foreign technology or even e-waste for the Peruvian musical market, and against possible practices of planned obsolescence, can result not only in the creation of a cheap and useful application of technology but in the enhancement of creativity in musical production. At this point, some of the interfaces built in Peru and that we have discussed have not been able to attract the "...sort of capital allocation support which will allow such 'know-how' to be sedimented in actual processes and structures in [our] societ[y].[96] As Alfredo Aliaga stated when asked about his customers: "..all my customers are foreigners, with the exception of one synth that was bought by a friend ...Peruvians are interested but have no buying power"[97], Carlos Garcia, the first one to mass produce home-made oscillators in Peru during the last decade was able initially to get Peruvian musicians to buy his oscillators and then move to a foreign clientèle increasing dramatically the prices of his products and has relocated to Sweden. This two examples make it difficult to defend the possibility for a development of micro-industries for musical electronic interfaces and instruments, but not necessarily for the personal construction of these interfaces.

The design and construction of an interface carries political connotations. Whether these connotations are acknowledged and consciously constructed or not, they define the conditions of negotiation between the participants and the social

96 H.T. Wilson, Tradition and Innovation: The Idea of Civilization as Culture and Its Significance (London: Routledge, 1984), 57.

97 Alfredo Aliaga, Personal Communication.

systems that surround them. The quality and success of our tools for artist expression determines the shaping of the musical landscapes they inform. Peruvian interfaces should become effective mediators that contribute to the social fabric of a musical tapestry liberated from technological segregation. The interface is the message, including the results of the symbiotic relationship between the designer and the social structures present in the process of designing/constructing/performing. As David Rokeby stated:

> By defining a way of sensing and a way of acting in an interactive system, the interface defines the "experience of being" for that system. Through their design of the interface, the creators have in large part defined the user's "quality of life" while they are interacting with the system. Unfortunately, the design parameters for quality of life are pretty undefined. There seems to be no agreement on what makes for a high "quality of life." I suspect it's dependent on a whole range of parameters that we rarely pay attention to.[98]

Some authors consider that the "[m]usical interfaces that we construct are influenced greatly by the type of music we like, the music we set out to make, the instruments we already know how to play, and the artists we choose to work with, as well as the available sensors, computers, networks, etc".[99] I believe this is only possible when all these choices are available. Contemporary musicians in the western world function under the assumption that all their desires could be granted if they put in enough effort. For a country like Peru something as simple as physically accessing musicians in other countries, let alone the possibility of studying in a foreign country, might became a big challenge or an unsurmountable mountain. This interface follows

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98 David Rokeby. "The Construction of Experience: Interface as Content," in Digital Illusion: Entertaining the Future with High Technology Clark Dodsworth, Jr., Contributing Editor. (Reading: Addison-Wesley Publishing Company, 1998). Available at http://www.activerat.ch/ratlab/textes/DRokeby1.pdf, 3.

99 Peter Cook, "Principles for Designing Computer Music Controllers", ACM CH Workshop in New Interfaces for Musical Expression (NIME). Seattle: April, 2001, 1.

the spirit of dreaming of possible controllers for specific situations. Not all possible controllers and interfaces make sense for Peru, which I do not consider a disadvantage but an open door to creativity. It is up to us, the members of the Peruvian community, with access to information and learning institutions to help in whatever is possible as a bridge between higher education and the international community and the developing electronic experimental scenes of the country.

4.2 When I move Computers Sing

This part of the work discusses an interface that uses many of the values and ideas presented in Chapter 3. A compressed version of this section is present in my text "Cuando Canto Bajan los Cerros: An Initiative for Interface Development Informed by a Latin-American Context."[100] The interface is developed with the hope of generating alternative gestural and performative techniques useful to the specific cultural environment of Lima, Peru. It also uses for its construction a postcolonial and autoethnomusical approaches in the sense that it hopes its relevance can be primarily defined by users in their own context. It is a work in progress that calls for a language that represents the unique needs of a culture-region and the realistic possibilities of technological application for that particular setting. The possibilities of human computer interaction depend on our definition and careful consideration of the 'human' participating in the process. The technological choices are not attached in any particular way to Peruvian culture but are used as an attempt to look at the process of adopting foreign technology for local use. This paper is intended to lead to further research into the possibilities raised when exchanging technological ideas for

100 Jose Ignacio Lopez Ramirez-Gaston,. "Cuando Canto Bajan los Cerros: An Initiative for Interface Development Informed by a Latin-american Context," Proceedings of the 2008 International Computer Music Conference (Belfast, 2008).

music making across cultural divides.

The interface proposed in this work uses a variety of tools and techniques for the collection of data. It bases its motivation and conceptual interest on the Latin-American environment were I grew up (Lima, Peru), and particularly on the problems I had during my youth accessing technology for musical purposes. Under the motto of 'low budget, high concept' and the intention of generating the best practical results with the elements at hand, this interface attempts to use tools publicly available at a low cost. I believe the possibilities of implementing an interface in a cultural environment are directly dependent on our knowledge and considerations of the areas were we would like to implement them. In this way, even though this tool has possible universal application, it is designed thinking of low budget Latin America and with the conceptual push of the DIY culture of the United States. This is why the tools selected for the creation of this interface require only a low technical and economical investment. Creativity, simplicity and personal time are the basic necessary elements for its implementation. The interface uses three basic tools: (1) Pure Data, (2) T-sensors or Theremin circuits and (3) piezoelectric transducers, as described in the following sections.

While it is not the main intention of this work to generate a particular gestural language, I believe the interface offers a liberating opportunity for a musical style and scene that is in my opinion in a desperate need for new alternative means of physical expression that are simple, accessible and affordable. Manifestations of this need in Peru could be: Theremyn 4's use of an Alesis Air FX hand controlled digital effects unit for live performances since the beginning of the 2000s, the new circular synth by Carlos Garcia of Zebranalogics, the addition of a photo sensor in the new Abyssal home-made synth by Alfredo Aliaga, and the Corse Sonico by Paola Torres Núñez del Prado.

Alternative interfaces that require physical participation also improve the possibilities of a non-trained musician or an artist from a different artistic background to do music. As Paola Torres states when explaining the Corse Sonico: "I thought that a good way to resolve the fact that I don't know how to play any instrument was to make a controller myself, one that would allow me to scream at the same time that I am activating processes."[101]

New Peruvian sound artists like Leonardo Camacho explore the notion of including several layers to the generation of sound including aesthetical considerations, performance, instrument fabrication and technical knowledge, etc. As he stays "...everything is important at the end: music, sound, aesthetics, perfomance, the body".

A more complex notion of interface building in Peru is the Laser Arp of Enrique Mayorga and the Grupo de Arte Electronico Interactivo of the Pontificia Universidad Catolica del Peru. This interface presented in 2002 at the International Symposium on Electronic Arts in Nagoya, Japan, while similarly interested in a non-conventional physical control for music or sound creation, is uncommon for the Peruvian world and unrelated to our discussion since it represents an ideal environment that includes access to education, information and technology. Technological change brings together with innovation mechanisms of exclusion inside societies, specially in Peru were membership into particular 'circuits of knowledge' is not automatic.
However, if conditions in Peru change in the near future and access to education related to music and technology become more of a common occurrence the condition of interface construction would dramatically change. The country has seen

101 Paola Torres, personal communication July 2008.

in the last year an increase in learning options promoted mainly by institutions like the Sonoteca of the Centro Fundación Telefónica and the Centro Cultural de España, festivals like VAE (Festival Internacional de Video/Arte/Electrónica), and organizations like ATA (Alta Tecnologia Andina) and Realidad Visual. Through this work we have presented different examples of the way these institutions and organizations have help to fill a void and open a future for the sound arts in general. As Omar Lavalle, electronic musician and coordinator of events for Lima's Sonoteca stated when asked about the achievements of the institution: "It generated a platform to show the work of some people and projects that were being done in Peru. I believe there was not an space for this kind of music. There were some net-labels for specific styles (noise, electronica, etc) but not one that congregated all genres and represented Peru."[102]

While computers had initially restricted the movement of performers, in comparison to traditional instruments, by limiting the gestures to 'typing' information to a keyboard; the use of sensors and alternative interfaces allows from a freedom unprecedented in musical interpretation. A musician using a computer as his/her main instrument in a live performance has multiple alternatives for using the body as an expressive tool for both the generation of a physical connection with the sound produced and for connecting to an audience. The interface I use as an example here is also the result of my personal need to be able to express myself physically when performing live my own music.

{hablar de la electricidad, del material (por q no llueve por ejemplo] las posibilidades de trasporte, hazlo tu por q comprar los q hacen en Peru es caro].

The interface we use as an example on this work consists of a foldable circular

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102 Omar Lavalle, electronic communication, 7 August 2008.

structure that when opened surrounds the singer at waist level and contains three T-sensors in different positions so the performer can control predefined parameters with his/her hands. It also contains two piezoelectric-transducers used as on/off switches for different parameters, which can be defined and rearranged for each performance.

Two versions of the interface have already been tested. One made out of wood and a second one made out of cardboard. The cardboard version seems to be a better option for international traveling or local public transportation. In April of 2008 I traveled with the cardboard version from California to Peru which proved to be a relatively easy task. Figure 9 shows the setting up of the interface in Lima and Figure 8 shows the testing of the cardboard interface.

Figure 8: Version of the interface made out of wood

The setting up takes longer than for the wood version since the circuits have to be saved independently from the 'table' and are not attached to it and only placed on top of it, while in the wood version of the interface everything is already set up

internally and ready for performance as soon as it is unfolded. Further testing will define the best option by comparing portability, weight, durability and resistance.

Figure 9: Setting up the cardboard version of the interface

Figure 10: Testing of the cardboard version of the interface

The interface is divided in three areas. Each one of these areas can include different sensors for the capturing of information. The version tested that we will discuss

here uses three T-sensors/Theremins and two piezoelectric transducers for control. The information received by the sensors is routed to a Pure Data patch. The following diagram can give us a basic idea of how the information is routed to the computer.

The three T-sensors used are connected to a switcher that works together with a PIC controller to send MIDI information through a MIDI interface to a computer with Pure Data.

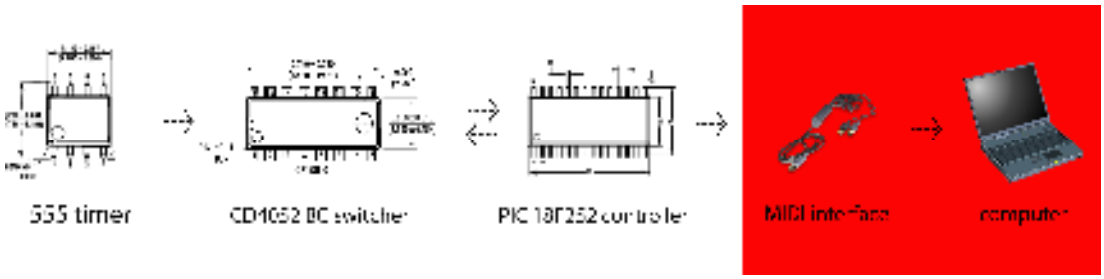

Figure 11: routing of information

4.2.1T-sensors

I conceived of an instrument that would create sound
without using any mechanical energy, like the conductor of an orchestra.
The orchestra plays mechanically, using mechanical energy;
the conductor just moves his hands,
and his movements have an effect on the music artistry.
Leon Theremin

Movement information is received by Pure Data through standard Theremin or

T-sensor circuits. The classic Theremin, invented by Russian scientist Leon Theremin in 1919, is a musical instrument based in the heterodyne principle to produce sound. The heterodyne principle is based on the simple product-to-sum trigonometric identity.

By mixing and multiplying two oscillating waveforms we can generate two new frequencies according to the properties of a sine function, one based on the sum of the frequencies used and the other one on the difference. While setting one of the resulting frequencies outside the audible range the other one can be controlled to produce pitch variations.

While using the heterodyne principle for a Theremin could be the most accurate and reliable way to gain control over the frequencies used for the instrument, it requires two oscillators per Theremin. A simpler Theremin can be constructed by using only one oscillator. This selection is also important for the simplicity of its fabrication and the accessibility of the materials.

In the case of this interface I use three Theremin/T-sensors connected to a switcher and a PIC that transfers the information by MIDI to a computer where it is received by Pure Data.

The Sensors are a variation of the one used by Terry Fritz on his Theremin Vision – II, an essential source of information[103]. While the Theremin Vision uses the heterodyne principle by relating two different circuits, one used as a sensor oscillator and the other one as a reference oscillator; in this particular interface I use each electric field sensor independently. An example of contemporary use of electric field sensors like the ones on this interface is the Multimodal Music Stand developed at the University of

103 http://thereminvision.com/

California, Santa Barbara[104].

4.2.2 Oscillator/555 timer

The 555 timer IC (Integrated Circuit) was the first commercial timer IC and is still used for several basic sound projects by hobbyists of home built electronics because it is cheap, stable and very user-friendly.

The interface Theremin is implemented with a 555 timer in 'astable' mode as a square wave oscillator. The period of the oscillation is determined by the charging time of an external capacitor. As the capacitance increases the period of oscillation increases and therefore the frequency decreases. The T-sensor uses a fixed 22pF external capacitor to set a base oscillation frequency of around 100 kHz. The antenna and the body of the performer form the two plates of a second capacitor. The second capacitor is parallel with the 22pF capacitor and therefore the total capacitance is found by adding their respective values. By varying the distance between the performers hand and the antenna the capacitance of the second capacitor is changed. This results in varying the overall external capacitance of the timer circuit which in turn produces a change in the frequency of the output signal.

104 http://www.create.ucsb.edu/~dano/MMMS/

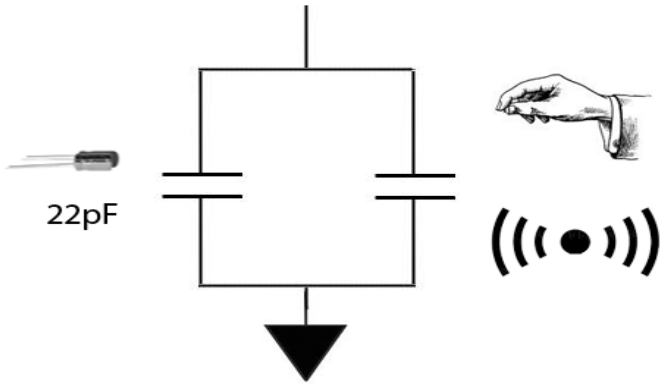

Figure 12: Capacitance diagram

Any number of T-sensors can be used to control as many parameters as wanted. In the case of this interface we use three, with the possibility of adding a fourth one according to the specifications of the switcher we explain next.

The sensor antennas, visible on the cardboard version, are made out of loops of flexible galvanized wire of 5 x 5 inches each. This set up provides a range of about 6 inches, measured perpendicular to the surface of the antenna. The sides are less receptive which helps avoid interference from the body of the performer. The sensing range has been calibrated according to the distance between sensors and the physical comfort of a performer-singer. This range can be lowered, if necessary, by adjusting a 100k trimpot on the sensor.

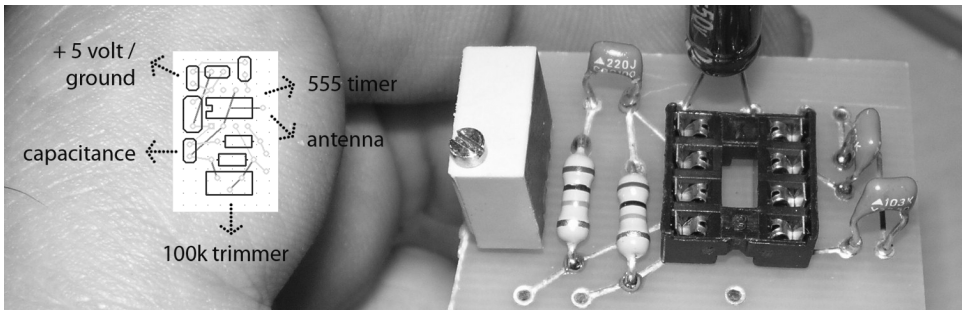

Figure 13: Circuit for the T-Sensor

4.2.3 Switcher/CD4052 BC Multiplexer

The output of each T-sensor is a variable frequency square wave. In order to be transmitted to the host computer this signal must be converted into a numeric MIDI value. The PIC microprocessor is responsible for this conversion and the MIDI communication with the host. The PIC uses an internal counter circuit to count the number of on-off square wave transitions during 2 millisecond time periods to determine the frequency of a T-sensor square wave. It then transmits the counter value as MIDI pitch-bend values to the host computer.

The PIC has only one internal counter capable of performing the frequency to MIDI conversion. To accommodate three T-sensors a three-to-one routing switch (CD4052BC Dual 4-channel Analog Multiplexer/Demultiplexer) is placed between the T-sensors and the PIC. In this arrangement the output of each T-sensor is connected to the input channel of the switch. The output of the switch is then connected to the counter input pin on the PIC. The PIC is also connected to the switch control pins allowing it to sequentially select one of the three input channels every 2 milliseconds.

4.2.4 Counter and MIDI transmission/PIC 18F252 Controller

The interface uses a 18F252 Controller to communicate the information from the T-sensors to the computer as MIDI data. The C++ code used to program the controller was written by Kevin Larke for this interface. As we mentioned before the PIC sends the information to switch channels every 2ms to the switcher using pins 23 and 24 sending all possible combinations of a ground/voltage pair (in this case three for the three sensors), each combination corresponding to a sensor input as explain in the following chart, were A and B represent the input pins on the switcher and their values 0 and 1, ground and 5 volts respectively. The instructions for channel switching can be found on lines 445 to 455 of the code.

A	B	Channel
0	0	sensor 0
0	1	sensor 1
1	0	sensor 2

The PIC program is designed to simultaneously perform the frequency to numeric conversion on one sensor while transmitting the previously converted sensor value. This design eliminates the time gaps between sensor readings which would occur if the conversion and transmission were done sequentially.

The steps taken by the controller are:

1. start a 2ms timer
2. read and store counter value
3. select next sensor
4. reset/start the counter

5. low pass filter and transmit the stored counter value

6. wait for the 2ms timer to elapse and start again

The information to be transmitted by MIDI goes through a low-pass smoothing filtering to eliminate noise. The smoothing filter works by taking the average of the current and previous three values (see lines 460 to 469 of the code). The smoothed values are transmitted as MIDI pitch bend messages. The PIC MIDI implementation is included as a C header (midiapp.h). The PIC serial port is connected to the host computer through a commercial MIDI interface. Pure Data reads directly from the MIDI port the information from the sensors as incoming pitch bend values with the [bendin] object according to the MIDI channel assigned. Once the signal is received, an initial calibration needs to be made to define the minimum and maximum distance points for the sensors and their equivalent numbers. Some basic math is necessary to convert the pitch value received into a range that starts with a zero to maintain the effect lines deactivated until the hand crosses the range of control.

4.2.5 Piezo Transducer

To take advantage of the regular stereo audio input on a computer, one side of the stereo signal is assigned for the performer's microphone and the other to a piezoelectric transducer (from now piezo) used to turn on and off the singer's input. The piezo is used as a contact microphone and set through the audio input for Pure Data and to a db/gain threshold. By tapping on the piezo a mute option for the microphone is activated. I do not consider this to be the more effective way to generate an on/off sensor but is definitely the most accessible in comparison with commercial touch or pressure sensors.

4.2.6 Pure Data

Besides the common practice of using cracked versions of software for musical production, there is the possibility of free or open source software. The use of pirate copies of commercial software always open the possibility of the program failing or being penalized for copyright and intellectual property infringement. The social ethics of hacking culture as developed in the Massachusetts Institute of Technology (MIT) during the 1950s and 1960s fit perfectly the needs of Latin America. The basic principles present in Steven Levy's seminal work "Hackers: heroes of the Computer Revolution"[105] are not only conceptually important but essential for artistic development and musical production in Peru. The notions of sharing, openness, free access to computers, world improvement, the use of computers of artistic purposes, complete freedom of information, and the use of computers for personal transformation and improvement; seem not only useful universally but a momentary solution to current problems of accessing information and tools.

This is why the software platform used by the interface is Pure Data, a graphical programming language for the creation of interactive computer music and multimedia works, created by Miller Puckette at the University of California in San Diego[106]. Pure Data has opened the door to digital artists in Latin America to a world of musical creation that relies on the aesthetics and political implications of the free Open Source software culture. While at this point users of Pure Data in Peru are almost exclusively members of the academia or musically trained performers (whether they participate in popular electronic music or not), the figure is changing as popular

105 Steven Levy, Hackers: Heroes of the Computer Revolution (New York: Anchor Press/Double Day), 1984.

106 Software available at http://puredata.info/

performers start to get access to information and the culture of the sound arts.

The search for a ´legitimate´ working software platform is not merely a utilitarian quest, since "(s)oftware is not just a device with which the user interacts; it is also the generator of a space in which the user lives"[107] and it becomes obvious that the case of Peru calls for the support of free or affordable options. Only a basic knowledge of Pure Data is necessary to make the patches run. Alternative variations could and will include more sophisticated patches according to specific requirements by different authors or performers. A very basic patch could include: and [adc~] object using both regular channels of a regular computer for any configuration of microphones or piezo sensors (explained later) for a voice input to be transformed or a signal to be used as control; a collection of arrays with sound files for playback written on them with [soundfiler]; and a set of effects to be selected (ex: reverberation, delay, etc). and with their parameters controlled by the user through [bendin] objects receiving MIDI information from T-sensors.

The patches used so far for the interface include different options for live performance. The patch show here has the option of playing a composed piece from beginning to end, make variation or process parts of the composed piece during playback, play randomly samples of parts of the piece for live processing, or controlling both the playback of samples and the processing with the T-sensors. The level of live participation can be decided at the moment of the performance. This allows the interface to serve as a bridge between the largely common practice by electroacoustic and tape music performers to present their pieces with almost no participation and the obsession by popular electronic musicians to show their skill at

---

107 Terry Winograd Ed., "Introduction," in Bringing Design to Software (New York: ACM Press, 1996), xviii.

processing live in order not to 'cheat' the audience. Traditional roles can be switched and alternative intermediate resolutions achieved. Pre-composed musical pieces can loose the stiffness of regular playback or be reconfigured completely at every performance, while a musician accustom to live improvisation can perform semi-organized variations of a mostly intuitive and random performance.

As an example, in one of the version that I have used for live performances (as shown here), the three inputs from the t-sensors are received in MIDI channels 1, 2 and 3 by Pure Data and controlling delay time and feedback gain, and reverberation feed back gain. An electronic piece is played and effects controlled during the performance by moving the hands over the sensors antennas.

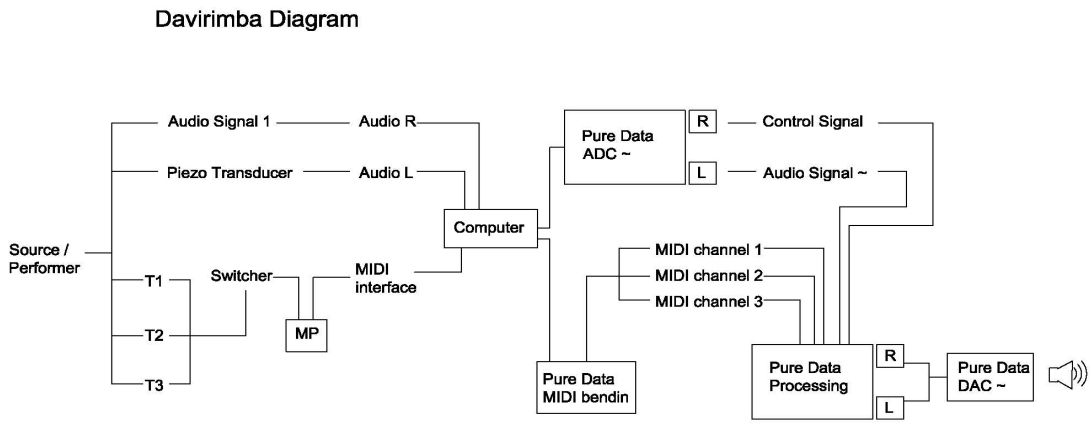

Figure 14: Audio routing for the interface

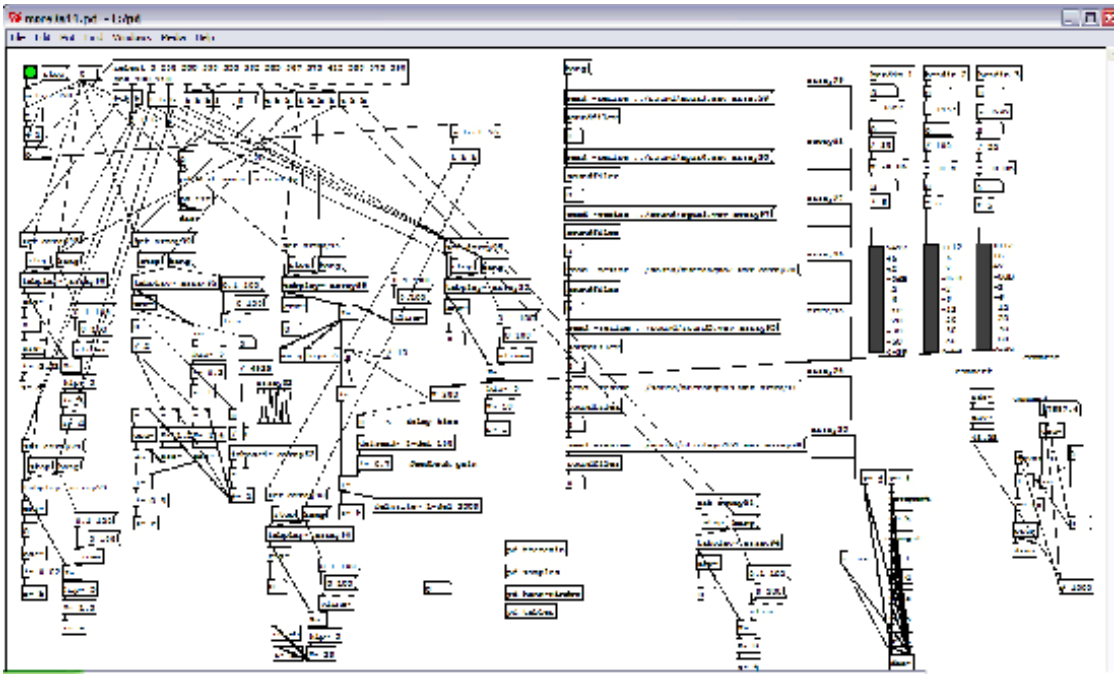

Figure 15: Pure Data patch example

Chapter 5

Conclusions

I believe this work accomplishes multiple goals, some of them are intentional and others are the result of a need to find qualified information for my research. The more basic achievement is Participation, This paper initiates the inclusion of the Peruvian voice in possible future academic conversations about music and technology. Is a simple question of quantity and quality. An increase in the number of academic participants from a community enhances the research quality and acts as an important addition to the process of social transformation in the democratization of knowledge. A second goal was the gathering of information regarding a contemporary musical culture of Peru. The Community discussed through this paper is, as all musical manifestations, an expression of culture that needs to be preserved, studied and most importantly: understood in its own terms. A third goal has a more direct political tint and includes the addition of Peruvian content to the list of post-Colonial studies and approaches to contemporary knowledge as well as an encouragement of local practices for survival in a global situation.

This interface developed in Chapter 5 is not a solution but an example. It hopes to add to the conversation for the generation of alternative 'messages' useful to a specific cultural environment: Lima, Peru. It also uses for its construction a post-Colonial approach in the sense that its relevance can be primarily defined by the users in their context. This thesis is a work in progress that calls for a language that represents the

unique needs of a culture-region and the realistic possibilities of technological application for that particular setting. The possibilities of human computer interaction depend on our definition and careful consideration of the 'human' participating in the process. The technological choices are not attached in any particular way to Peruvian culture but are used as an attempt to look at the process of adopting foreign technology for local use. This paper is intended to lead to further research into the possibilities raised when exchanging technological ideas for music making across cultural divides.

APPENDICES

6.1 A 1: **efield3.c - 3-d Capacitive Program for PIC 16Fxxx/18Fxxx**

```
/*

        efield3.c - 3-d Capacitive Program for PIC  16Fxxx/18Fxxx
   Copyright (C) 2004, 2005, 2006, 2007, 2008  Kevin Larke kevin@larke.org

   This program is free software: you can redistribute it and/or modify
   it under the terms of the GNU General Public License as published by
   the Free Software Foundation, either version 3 of the License, or
   (at your option) any later version.

   This program is distributed in the hope that it will be useful,
   but WITHOUT ANY WARRANTY; without even the implied warranty of
   MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
   GNU General Public License for more details.

   You should have received a copy of the GNU General Public License
   along with this program.  If not, see <http://www.gnu.org/licenses/>
*/

#include <18f2320.h>
#fuses     H4,NOWDT,NOPROTECT,BROWNOUT,PUT,NOLVP,DEBUG
#device  ADC=10

//#CASE  // make the compiler case sensitive

#use       delay(clock=40000000)
#use       rs232(baud=31250, xmit=PIN_C6, rcv=PIN_C7, parity=N, bits=8)

//#use     fast_io(a)
#use       fast_io(b)
#use       fast_io(c)


//*****************************************************************
//
// Processor Dependent settings
//

// The follow memory reserves are only needed for debugging
```

```
// If we use the 'Build Settings' | CCS | 'Compile for use with ICD'
// option then the compiler automatically reserves this space.

// 18f232
#ORG                    0x1DC0, 0x1FFF {}       // reserved pgm memory
#RESERVE                0x1F4:0x1FF                             // reserved RAM
#RESERVE                0xFD4
#RESERVE0xFB5:0xFB9

#bit crenFl                                             = 0xfab.4
#byte adResH                    = 0xfc4
#byte adResL                    = 0xfc3
#byte adCon0                    = 0xfc2
#byte adCon1                    = 0xfc1
#bit  adGoDoneFl     = 0xfc2.1

//*****************************************************************
//
// Board Dependent settings
//

#define timer32ms               (40000)     // these assume timer is set up as div_8
#define timer16ms               (20000)
#define timer8ms                (10000)
#define timer4ms                (5000)
#define timer2ms                (2500)
#define timer1ms                (1250)
#define timerCnt                (timer4ms)

#define uSecsPerSec                             (1000000)
#define crystalHz                               (40000000)
#define baseTimerHz                             (crystalHz/4)           // 10000000 ticks
per sec @ 40Mghz
#define baseTimerHz_Div2        (baseTimerHz/2)         //  5000000 ticks per sec @
40Mghz
#define baseTimerHz_Div4        (baseTimerHz/4)         //  2500000 ticks per sec @
40Mghz

// timer setting to acheive interrupt at X ms with (DIV_BY_1)
#define tCnt_Div1_4ms           (0xffff - 40000)        // 250 hz
#define tCnt_Div1_2ms           (0xffff - 20000)        // 500 hz
#define tCnt_Div1_1ms           (0xffff - 10000)        // 1 khz
#define tCnt_Div1_500us  (0xffff - 5000)        // 2 khz
#define tCnt_Div1_250us         (0xffff - 2500)         // 4 khz
#define tCnt_Div1_125us         (0xffff - 1250)         // 8 khz
#define tCnt_Div1_62p5us (0xffff - 625)                 // 16 khz
```

```
// count down to acheive interrupt at X ms with (DIV_BY_2)
#define tCnt_Div2_8ms           (0xffff - 40000)
#define tCnt_Div2_4ms           (0xffff - 20000)
#define tCnt_Div2_2ms           (0xffff - 10000)
#define tCnt_Div2_1ms           (0xffff - 5000)
#define tCnt_Div2_500us (0xffff - 2500)
#define tCnt_Div2_250us         (0xffff - 1250)

// count down to acheive interrupt at X ms with (DIV_BY_4)
#define tCnt_Div4_16ms          (0xffff - 40000)
#define tCnt_Div4_8ms           (0xffff - 20000)
#define tCnt_Div4_4ms           (0xffff - 10000)
#define tCnt_Div4_2ms           (0xffff - 5000)
#define tCnt_Div4_1ms           (0xffff - 2500)
#define tCnt_Div4_500us (0xffff - 1250)
#define tCnt_Div4_250us         (0xffff - 625)

// count down to acheive interrupt at X ms with (DIV_BY_8)
#define tCnt_Div8_32ms          (0xffff - 40000)
#define tCnt_Div8_16ms          (0xffff - 20000)
#define tCnt_Div8_8ms           (0xffff - 10000)
#define tCnt_Div8_4ms           (0xffff - 5000)
#define tCnt_Div8_2ms           (0xffff - 2500)
#define tCnt_Div8_1ms           (0xffff - 1250)
#define tCnt_Div8_500us         (0xffff - 625)


#define chSelectPinA            (PIN_B3)
#define chSelectPinB (PIN_B2)
#define chSelectPinC            (PIN_B1)
#define midiRcvLed_PIN          (PIN_B5)
#define ackLed_PIN              (PIN_C1)
#define errLed_PIN              (PIN_C2)


#define midiInitCtlId           (0)
#define chEnableCtlId                   (75)
#define chDisableCtlId                  (76)
#define singleChModeCtlId       (77)
#define reportCtlId                     (79)
#define reportMidiCh                    (15)

#define midiBaseNote                    (60)

#define invalidIdx              (0xff)
#define chCnt                           (3)
#define delayCnt                (4)
```

```
//*************************************************************
//
// Data Structures
//
typedef struct
{
        int8 midiCh;
} globals;

#define chEnableFl   (0x01)      // is ch enabled
#define chSendFl     (0x02)      // set when the delay buffer has at least 'delayCnt'
valid values

typedef struct // all fields should be initialized in chEnable()
{
        int8        flags;                                          // is this ch
enabled
        int8        delayIdx;                       // next location to write in
delay[]
        int16       delay[ delayCnt ];      // holds the previous 'delayCnt' values
from CCP
        int16       sum;                            // holds the current sum of all
values in delay[]
        int16       sendVal;                        // last value this ch sent to the
host
        int8        sendCnt;                        //
} chRecd;

//*************************************************************
//
// Program State Defines
//
globals g;

int8        _midiRcvCnt             = 0;
int8        _ackFlashCnt            = 0;


int1        _tmSyncFl               = 0;
chRecd      _chArray[ chCnt ];
int8        _singleChMode           = invalidIdx;
int16       _tmrCnt                         = 0;
int8        _chOutIdx               = 0;
int16       _timeOutErrorCnt= 0;

//*************************************************************
//
```

```
// Code Macros
//
#define ledOn(p)                                output_high(p)
#define ledOff(p)                               output_low(p)
#define ledEnable(p,f)                          output_bit(p,!(f))
#define setFlag(fl,mask)            ((fl) |= (mask))
#define clrFlag(fl,mask)            ((fl) &= (~(mask)))
#define isFlag(fl,mask)                         ((fl) & (mask))
#define enaFlag(fl,mask,bfl) (bfl ? setFlag(fl,mask) : clrFlag(fl,mask))

//*****************************************************************
//
// Include the MIDI parser
//
#define maMidiRcv(a) (_midiRcvCnt=3)
#include "midiapp.h"

#INT_TIMER3             // 2ms clock
void tmr3ISR()
{
        set_timer3(tCnt_Div1_2ms);
        _tmSyncFl = 1;
}

void maOnMidiMsg1(byte st)
{
}



void chEnable( int8 midiCh, int8 chIdx, int8 enableFl )
{
        int8 i;

        // validate the index
        if( chIdx >= chCnt )
                return;

        // if the ch is not already in the requested state
        if( enableFl != isFlag(_chArray[chIdx].flags, chEnableFl)  )
        {
                if( enableFl )
                {
                        _chArray[ chIdx ].delayIdx  = 0;
                        _chArray[ chIdx ].sum               = 0;
                        _chArray[ chIdx ].sendVal           = 0;
                        _chArray[ chIdx ].flags             = 0;
                        _chArray[ chIdx ].sendVal           = 0;
                        _chArray[ chIdx ].sendCnt           = 0;
```

```
                                        for(i=0; i<delayCnt; i++)
                                                _chArray[chIdx].delay[ i ] = 0;
                        }

                        enaFlag(_chArray[ chIdx ].flags, chEnableFl, enableFl );

                }

                maSendMidi3( maDStCtl+midiCh, (enableFl ? chEnableCtlId : chDisableCtlId),
chIdx+1 );
}

int1 onCtl( int8 midiCh, int8 dt0, int8 dt1 )
{
                int1 ackFl = 1;
                int16 v;
                int8 chIdx;

                switch( dt0 )
                {
                        case chEnableCtlId:
                                chEnable( midiCh, dt1-1, 1 );
                                ackFl=0;
                                break;

                        case chDisableCtlId:
                                chEnable( midiCh, dt1-1, 0 );
                                ackFl=0;
                                break;

                        case singleChModeCtlId:
                                _singleChMode = dt1;
                                break;

                        case reportCtlId:
                                chIdx = _chOutIdx;
                                switch(dt1)
                                {
                                        case 0:

                maSendPBend(15,_chArray[chIdx].sendVal);
                                                        break;

                                        case 1:
                                                v = _chArray[ chIdx ].sum >> 2;
                                                maSendPBend(15,v);
                                                break;

                                        case 2:
```

```
                maSendPBend(15,_chArray[chIdx].sendVal);

                maSendPBend(15,_chArray[chIdx].delayIdx);
                                                maSendPBend(15,_chOutIdx);

                maSendPBend(15,_singleChMode);
                                                break;

                                        case 3:
                                                v = _tmrCnt >> 2;
                                                maSendPBend(15,v);
                                                break;

                                        case 4:
                                                v = _timeOutErrorCnt & 0x3fff;
                                                maSendPBend(15,v);
                                                break;

                                        case 5:
                                                v = get_timer1();
                                                maSendPBend(15,v);
                                                break;


                                }
                                break;


                        default:
                                ackFl = 0;
                }
                return ackFl;
}

void maOnMidiMsg3(byte midiCh, byte st, byte dt0, byte dt1)
{
                int1 ackFl = 0;

                if( (st==maDStNoteOn) && (dt1==0) )
                {
                        st=maDStNoteOff;
                }

                switch( st )
                {
                        case maDStPgm:                                  // pgm change
                                break;
```

```
                        case maDStChanPr:               // channel pressure
                                break;

                        case maDStNoteOn:
                                ackFl = true;
                                break;

                        case maDStNoteOff:
                                break;

                        case maDStPBend:
                                break;

                        case maDStCtl:
                                ackFl = onCtl(midiCh, dt0,dt1);
                                break;

                        default:
                                break;
                }

                if( ackFl )
                {
                        _ackFlashCnt = 3;
                        maSendMidi3( st+midiCh, dt0, dt1);
                }


}


void maOnMidiRtMsg(byte st)

{
}


void maOnMidiSysExData(byte data, byte cnt)

{
}


void maOnMidiEndOfSysEx(byte cnt)

{
}
```

```
void maOnMidiError(byte errorId, byte param)
{
	switch( errorId )
	{
		case maDRcvBufOverFlowEC:	break;
		case maDOkEC:					break;
		case maDUndefStatusEC:		break;
		case maDIllegalStateEC:		break;
		case maDUnknownStateEC:		break;
		default:
	}
}


void main()
{
	int8	j = 0;
	int8	chInIdx =0;
	int16	sendVal;
	int16	cycleCnt = 0;
	int8	ci;
	int16	sum;
	int8	di;

	g.midiCh = 0;

	// setup the pin I/O
	//set_tris_a(0x03);
	set_tris_b(0x00);  // all outputs
	set_tris_c(0x81);  // input: rc7,rc0 output: rc6 ... rc3,rc0

	// flash the ack LED to conifirm chip has started
	ledOn(ackLed_PIN);
	delay_ms(500);
	ledOff(ackLed_PIN);

	// flash the MIDI rcv LED to confirm chip has started
	ledOn(midiRcvLed_PIN);
	delay_ms(500);
	ledOff(midiRcvLed_PIN);
	delay_ms(500);
	ledOn(midiRcvLed_PIN);
	delay_ms(500);
	ledOff(midiRcvLed_PIN);


	// setup the ch msg timer - 2ms timer
	setup_timer_3(T3_INTERNAL | T3_DIV_BY_1);
	//setup_timer_2(T2_DIV_BY_4,255,5);
```

```
	// setup the frequency counter
	setup_timer_1(T1_EXTERNAL | T1_DIV_BY_1);
	set_timer1(0);

	output_bit( chSelectPinA, 0 );
	output_bit( chSelectPinB, 0 );


	// enable and initialize all the channels
	for(j=0; j<chCnt; j++)
	{
		_chArray[ j ].flags  = 0;

		chEnable( g.midiCh, j, 1 );
	}

	maSendMidi3(maDStCtl,0,1);

	//enable_interrupts( INT_TIMER2 );
	enable_interrupts( INT_TIMER3 );
	maMidiSetup();

	while(1)
	{
		// wait for the 2ms boundary
		while( _tmSyncFl == 0 )
		{};

		// read the timer
		_tmrCnt = get_timer1();
		_tmSyncFl = 0;

		//chPtr = _chArray + chInIdx;			// get ptr to input
channel recd
		ci		= chInIdx;

		// update the channel input and output indexes
		_chOutIdx = chInIdx;
		chInIdx++;
		chInIdx = chInIdx == chCnt ? 0 : chInIdx;
		chInIdx = _singleChMode >= chCnt ? chInIdx : _singleChMode;

		// switch sensors - and begin measuring the new input channel
		output_bit( chSelectPinA, (chInIdx & 0x01) );
		//output_bit( chSelectPinB, (chIdx & 0x10) ); the compiler gen's
incorrect code for this				expression
		output_bit( chSelectPinB, ((chInIdx>>1) & 0x01) );
		output_bit( chSelectPinC, ((chInIdx>>2) & 0x01) );
```

```
                        // reset timer
                        set_timer1(0);

                        // process the channel associated with _tmrCnt
                        sum = _chArray[ci].sum;
                        di              = _chArray[ci].delayIdx;
                        sum = sum - _chArray[ci].delay[di]; // remove the oldest value
from sum
                        _chArray[ci].delay[di] = _tmrCnt;    // replace the oldest value in
the delay with the                                                      new value
                        sum = sum + _tmrCnt;                            // incr the sum
with the new value
                        _chArray[ci].sum = sum;
                // update the ch recd
                        di = di + 1;                                    // update the
delay index
                        di = (di==delayCnt) ? 0 : di;
                        _chArray[ci].delayIdx = di;


                        // enable the ch[].sendFl if it is currently disabled and we have
taken delayCnt                  measurements
                        // (prevents inaccurate values (due to 0's in the delay line) from
being sent when the              measurements first start )
                        enaFlag(_chArray[ci].flags, chSendFl ,
(isFlag(_chArray[ci].flags,chSendFl)==0) && (_chArray[ci].delayIdx == 0) );

                        // Determine which channel to process next.
                        // if the ch is enabled and ready to send - then send this channels
value to the host
                        _chArray[ci].sendCnt = (_chArray[ci].sendCnt + 1) % 6;
                        if( isFlag(_chArray[ci].flags,chEnableFl)       &&
                                isFlag(_chArray[ci].flags,chSendFl)  &&
                                (_chArray[ci].sendCnt == 0) )
                        {
                                sendVal = _chArray[ci].sum >> 1;
                                maSendPBend( _chOutIdx, sendVal );
                        }

                        // check for received MIDI
                        if( _tmSyncFl == 0 )
                                maMidiPoll();
                        else
                                _timeOutErrorCnt++;
                }
}
```

5.2 A 2: midiapp.h - header file for PIC 16Fxxx/18Fxxx MIDI parser and I/O

```
/*
            midiapp.h - header file for PIC 16Fxxx/18Fxxx  MIDI parser and I/O
   Copyright (C) 2003, 2004, 2005, 2006, 2007, 2008  Kevin Larke kevin@larke.org

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*/

#define _maRcvBufCnt                    (32)                    / size of the MIDI
rcv buffer in bytes
#define _maDUndefMask                   (0x80) // used in maMidiPoll::dnArray to
identify illegal status byte values

// MIDI parser state id's
#define _maDWfSt            (0x01)                              // waiting for
status byte
#define _maDWfD0            (0x02)                              // waiting for data
byte 1
#define _maDWfD1            (0x03)                              // waiting for data
byte 2
#define _maDWfStD           (0x04)                              // waiting for
status or data
#define _maDWfEox           (0x05)                              // waiting for end
of sysex

// private macros used by the parser
#define _maIsStatus(b)                  ((b) & 0x80)
#define _maIsSysCom(b)      ((b) >= maDCmMTCqf && (b) <= maDCmEox)

// private global variables
byte _maBuffer[_maRcvBufCnt];                       // midi rcv queue
byte _maNext_in     = 0;                                        // midi rcv queue
```

```
input index
byte _maNext_out     = 0;                                          // midi rcv queue
output index
byte _maState                = _maDWfSt;          // state of the parser (see
dWfXXX) above

#ifdef _maDUseBank3
#define _maDnArrayAddr                (0x10)      // offset into bank 3 of
_maDnArray
#define _maDnArrayCnt                             (23)
#else
byte _maDnArray[23] =
        {
                0x02,       // 00 (1d9) 0x80 note off
                0x02,       // 01 (1da) 0x90 note on
                0x02,       // 02 (1db) 0xA0 poly pres
                0x02,       // 03 (1dc) 0xB0 ctl ch
                0x01,       // 04 (1dd) 0xC0 pgm ch
                0x01,       // 05 (1de) 0xD0 ch pr
                0x02,       // 06 (1df) 0xE0 pbend
                0x00,       // 07 (1e0) 0xF0 sysex
                0x01,       // 08 (1e1) 0xF1 MTC qf
                0x02,       // 09 (1e2) 0xF2 sng posn
                0x01,       // 10 (1e3) 0xF3 sng sel
                0x80,       // 11 (1e4) 0xF4 (undefined)
                0x80,       // 12 (1e5) 0xF5 (undefined)
                0x00,       // 13 (1e6) 0xF6 tune request
                0x00, // 14 (1e7) 0xF7 eox
                0x00, // 15 (1e8) 0xF8 rt time clock
                0x80, // 16 (1e9) 0xF9 (undefined)
                0x00,       // 17 (1ea) 0xFa rt start
                0x00,       // 18 (1eb) 0xFb rt continue
                0x00,       // 19 (1ec) 0xFc rt stop
                0x80,       // 20 (1ed) 0xFd (undefined)
                0x00,       // 21 (1ee) 0xFe rt active sense
                0x00        // 22 (1ef) 0xFf rt system reset
        };
#endif

// some status bytes
#define maDSysEx              (0xf0)                  // sysex
#define maDCmMTCqf                        (0xf1)                  // system common
MTC quarter frame
#define maDCmTuneRqst (0xf6)                          // system common tune
request
#define maDCmEox                          (0xf7)      // system common end of
sysex
#define maDRtClock                        (0xf8)                  // system real-time
clock
```

```
#define maDStNoteOff            (0x80)                          // note off
#define maDStNoteOn                             (0x90)          // note on
#define   maDStPolyPr                           (0xA0)      // poly pres
#define maDStCtl                                (0xB0)      // ctl change
#define maDStPgm                                (0xC0)      // pgm change
#define maDStChanPr                             (0xD0)          // channel
pressure
#define maDStPBend              (0xE0)              // pitch bend

// error codes - sent as arg. to maOnMidiError()
#define maDOkEC
          (0)
#define maDUndefStatusEC                        (1)
#define maDIllegalStateEC       (2)
#define maDUnknownStateEC                       (3)
#define maDRcvBufOverFlowEC  (4)

// macros for sending MIDI messages
#define maSendMidi1( st )                       putc(st)
#define maSendMidi3( st, d0, d1 )               putc(st); putc(d0); putc(d1)
#define maSendMidi2( st, d0 )                           putc(st); putc(d0)
#define maSendMNote( pitch, vel )                       sendMidi3(0x90,pitch,vel)
#define maSendPBend( ch, v )                    putc(0xE0+(ch)); putc((v) & 0x7f);
putc(((v) & 0x3f80) >> 7 )


//7
// midi event handlers - the application must define these functions
//

// Handler for MIDI messages that contain only a status byte
void maOnMidiMsg1(byte st);



// Handler for MIDI messages that have a status and two data bytes
void maOnMidiMsg3(byte midiCh, byte st, byte dt0, byte dt1);

// Handler for MIDI Realtime messages
void maOnMidiRtMsg(byte st);


// Called with each byte of a sys ex msg
void maOnMidiSysExData(byte data, byte cnt);


// Called on the end of a sys ex msg.
void maOnMidiEndOfSysEx(byte cnt);
```

```
// Called if the MIDI parser detects invalid data (see the error id's above)
// 'param' is the byte being processed when the error occured except if
// the code is maDUnknownStateEC in which case it is the value of the
// unknown parser state.
void maOnMidiError(byte errorId, byte param);


// MIDI receive ISR
#int_rda
void _maSerial_isr()
{
                        int t;

                        byte b;

          b = getc();

                        if( crenFl )
                        {
                                    crenFl = 0;
                                    crenFl = 1;
                        }

  _maBuffer[_maNext_in] = b;

            t = _maNext_in;

            //_maNext_in = (_maNext_in+1) % _maRcvBufCnt;
                        _maNext_in++;
                        if( _maNext_in >= _maRcvBufCnt )
                                    _maNext_in = 0;

                        maMidiRcv(b);

            if(_maNext_in ==_maNext_out)
                        {
            _maNext_in = t;         // Buffer full
                                    maOnMidiError(maDRcvBufOverFlowEC,b);
                        }
}

void _midiSignalError(byte errorId,byte param)
{
            _maState = _maDWfSt;
            maOnMidiError(errorId,param);
}

void maMidiSetup()
{
```

```
#ifdef _maDUseBank3

                int8 i = _maDnArrayAddr;

                write_bank(3,i,0x02);     // 00 (1d9) 0x80 note off
                i++;
                write_bank(3,i,0x02);     // 01 (1da) 0x90 note on
                i++;
                write_bank(3,i,0x02);     // 02 (1db) 0xA0 poly pres
                i++;
                write_bank(3,i,0x02);     // 03 (1dc) 0xB0 ctl ch
                i++;
                write_bank(3,i,0x01);     // 04 (1dd) 0xC0 pgm ch
                i++;
                write_bank(3,i,0x01);     // 05 (1de) 0xD0 ch pr
                i++;
                write_bank(3,i,0x02);     // 06 (1df) 0xE0 pbend
                i++;
                write_bank(3,i,0x00);     // 07 (1e0) 0xF0 sysex
                i++;
                write_bank(3,i,0x01);     // 08 (1e1) 0xF1 MTC qf
                i++;
                write_bank(3,i,0x02);     // 09 (1e2) 0xF2 sng posn
                i++;
                write_bank(3,i,0x01);     // 10 (1e3) 0xF3 sng sel
                i++;
                write_bank(3,i,0x80);     // 11 (1e4) 0xF4 (undefined)
                i++;
                write_bank(3,i,0x80);     // 12 (1e5) 0xF5 (undefined)
                i++;
                write_bank(3,i,0x00);     // 13 (1e6) 0xF6 tune request
                i++;
                write_bank(3,i,0x00); // 14 (1e7) 0xF7 eox
                i++;
                write_bank(3,i,0x00); // 15 (1e8) 0xF8 rt time clock
                i++;
                write_bank(3,i,0x80); // 16 (1e9) 0xF9 (undefined)
                i++;
                write_bank(3,i,0x00);     // 17 (1ea) 0xFa rt start
                i++;
                write_bank(3,i,0x00);     // 18 (1eb) 0xFb rt continue
                i++;
                write_bank(3,i,0x00);     // 19 (1ec) 0xFc rt stop
                i++;
                write_bank(3,i,0x80);     // 20 (1ed) 0xFd (undefined)
                i++;
                write_bank(3,i,0x00);     // 21 (1ee) 0xFe rt active sense
                i++;
                write_bank(3,i,0x00);     // 22 (1ef) 0xFf rt system reset
```

```
#endif
  enable_interrupts(int_rda);
  enable_interrupts(global);
}

int1 maMidiPoll()
{
            static byte  b              = 0;                    // current byte being parsed
            static byte  d0             = 0;                    // first data byte of two data
byte messages
            static byte dn              = 0;                    // count of bytes for messages
of type 'status'
            static byte ch              = 0;                    // midi channel assoc'd with
status
            static byte status          = 0;                    // current status byte
            //static byte errorId       = maDOkEC;              // last error code

            if( _maNext_in == _maNext_out )
                        return 0;

            while(_maNext_in != _maNext_out)
            {
                                    b=_maBuffer[_maNext_out];

                        //_maNext_out=(_maNext_out+1) % _maRcvBufCnt;

                                    _maNext_out++;
                                    if( _maNext_out >= _maRcvBufCnt )
                                    _maNext_out = 0;

                                    // if the current byte is a status byte
                                    if( _maIsStatus(b) )
                                    {

                                        // if expecting data then signal an error
                                        if( (_maState == _maDWfD0) || (_maState ==
_maDWfD1) )
                                        _midiSignalError(maDIllegalStateEC,status);

                                                switch(_maState)
                                                {
                                                    case _maDWfSt:
                                                    case _maDWfStD:
                                                    status  = b & 0xf0;
                                                    ch                      = b & 0x0f;

                                                            // if is a channel voice msg
                                                            if( b < maDSysEx )
                                                            {
```

```
                                                #ifdef _maDUseBank3
                                dn= read_bank(3,_maDnArrayAddr+((b>>4) - 8));
                                                #else
                                dn = _maDnArray[(b>>4) - 8];
                                                #endif

                                                _maState    =
_maDWfD0;
                                                continue;
                                                }

                                        // set dn to the count of data bytes
associated with status byte b
                                        #ifdef _maDUseBank3
                                        dn= read_bank(3,_maDnArrayAddr+((b-
maDSysEx) + 7));
                                                #else
                                        dn = _maDnArray[(b-maDSysEx) + 7];
                                                #endif

                                                // verify that this
command byte is defined
                                                if( dn &
_maDUndefMask )
                                                {

        _midiSignalError(maDUndefStatusEC,b);
                                                        break;
                                                }

                                                // if this is a real-
time command
                                                if( b > maDRtClock
)
                                                {

        maOnMidiRtMsg(b);
                                                        break;
                                                }

                                                // if this is a sysex
command
                                                if( b == maDSysEx )
                                                {

        _maState = _maDWfEox;
                                                dn= 0;

        continue;
```

```
                                                                }

                                                                // if this is a system
common msg
                                                                if( b <=
maDCmTuneRqst )
                                                                {
                                                                        if( !dn )
                                                                        {

        maOnMidiMsg1(status);

        break;
                                                                        }


        _maState = _maDWfD0;

        continue;
                                                                }


        _midiSignalError(maDUndefStatusEC,b);
                                                                        break;

                                                        case _maDWfEox:

        maOnMidiEndOfSysEx(dn);
                                                                        dn = 0;
                                                                        _maState =
_maDWfSt;
                                                                        break;

                                                        default:

        _midiSignalError(maDUnknownStateEC,_maState);
                                                                        break;
                                                }
                                        }
                                        else // current byte is data
                                        {
                                                switch(_maState)
                                                {
                                                        case _maDWfD0:
                                                // if rcvd first data byte of a midi msg

                                                        case _maDWfStD:
                                                                if( dn == 1 )
                                                //if this is a midi double
```

```
                                                    {
                                                    _maState =
_maDWfStD;
                                                    if( ch == g.midiCh
)
                                                maOnMidiMsg3(ch,status,b,0);
                                                    }
                                                    else
                                                    {
                                                    d0 = b;
                                                    _maState =
_maDWfD1;
                                                    }
                                                    break;

                                                case _maDWfD1:
                                            // if rcvd second data byte of a midi
triplet
                                                _maState   = _maDwfStD;
                                                    if( ch == g.midiCh
)
        maOnMidiMsg3(ch,status,d0,b);
                                                    break;

                                                case _maDWfEox:
                                                // if rcvd a byte of sys ex data
                                                    dn++;

        maOnMidiSysExData(b,dn);
                                                    break;

                                            case _maDWfSt:
                                                // expected a status byte but
rcvd a data byte (error)

        _midiSignalError(maDIllegalStateEC,b);
                                                    break;
                                                default:

        _midiSignalError(maDUnknownStateEC,_maState);
                                                    break;
                                            }

                                            }  // end else (is data)
    } // end while()

    return 1;
}
```

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