

# 1.1. Circuit-bending and DIY culture

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## Abstract

This article analyses Circuit-Bending and its relation to the Do-it-yourself (DIY) culture. Circuit-bending is an experimental music practice which consists of opening up low voltage (battery powered) electronic devices (musical toys, radio devices, cd players, etc. – mostly technological waste) and of changing (bend) the way electricity flows through their circuits in order to achieve an ‘interesting’ result. After presenting the work of some artists who make use of this methodology we introduce the concept of proletarianisation by philosopher Bernard Stiegler and how such methodologies can act as de-proletarianisation tactics. Then, we present the Do-it-together (DIT) or Do-it-with-others (DIWO) discussion to bring into scene the notion of Relational Aesthetics.

**Keywords:** Circuit-Bending; De-proletarianisation; DIY Culture; Relational Aesthetic

## Introduction

This article relates Circuit-Bending to DIY culture focusing on the anti-consumerist, rebellious and creative aspects of this experimental practice. Generally speaking, circuit-bending consists of opening up battery powered electronic devices and of changing (bend) the way electricity flows through their circuits in order to achieve an ‘interesting’ result. One typically practices circuit-bending by removing and/or adding electronic components, connecting different circuits, or even adding organic elements to the circuit (bender’s body or even fruits and vegetables). The next step usually calls for soldering the components into the circuit or marking specific places to be touched. Finally, sometimes a case is designed for accommodating this newly created instrument.

The technique was named in 1992 by Qubais Reed Ghazala, in a series of articles he wrote for *Experimental Music Instrument* magazine. He discovered this method in 1967 when he accidentally let a screwdriver get into contact with the circuitry of a battery-powered amplifier, producing a short circuit that sounded rather ‘interesting’, as he puts it:

If this can happen to an amp, not supposed to make a sound on its own, what might happen if one were to short out circuits that already make a sound, such as keyboards and radios and toys? (Ghazala, 2004, p.97)

Another key player in the scene is Nicolas Collins, who developed the concept of Hardware Hacking, a very similar approach to building experimental instruments. In some sense circuit-bending has more randomness in its procedures, as the “rules of hardware hacking” (Collins, 2006, p. 7-8) are somehow more “conservative” than circuit-bending. In practice it is very

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difficult to differentiate them and it is very acceptable to say that circuit-bending is inscribed in hardware hacking.

As part of the experimental music tradition, circuit-bending follows the paths of such innovators as Alvin Lucier, David Tudor, Gordon Mumma, and John Cage, who pushed music frontiers forward, and also of Free Jazz, Punk and Industrial Music movements, pioneers in the DIY approach in music. These movements focus on improvisation; they value the immediacy and liveness, as well as the present time, in opposition to the "perfection" and cleanliness of the recording.

As Ghazala puts it, over the last several years, experimentalism has dropped out of academic environments and we can see that circuit-bending "has taken flight and can be heard within many popular genres."<sup>2</sup> Ghazala argues that "circuit-benders are at the very forefront of this experience of new experimentalism, constantly pushing music forward with original discoveries." (Ghazala, 2005, p.23)

The possibility of oscillating from inside and outside the institutional framework is certainly one of the remarkable characteristics of circuit-bending. Many of its practitioners recognize the feature of combining high and low culture, game and art. Being a circuit-bender and a trained musician himself, north-american *Casper Electronics*<sup>3</sup> notes that even though the practice is relatively simple, its appeal is far reaching. The novelty of producing sounds without the aid of sophisticated apparatuses and by using regular devices modified by the bender brings a creative perspective to bender activity: "From the viewpoint of the bender one enjoys the liberation found in modifying mass produced electronics and making them one's own."

Casper is also an academic; he states that bending, as an academic research field, "can be appreciated for its inventive approach to electrical engineering, the encouragement it gives to question the concept of obsolescence, the recycling of discarded technologies." For him, the most profound issue brought to surface by bending circuits comes from granting the bender sight into the world that exists below our familiar world, "for circuit-bending most often targets children's toys as creative fodder." He keeps on arguing that the toys benders use are usually the one's they have grown with, having a deep connection with them. This brings benders a "perceptual shift" regarding the world around them and encourages people to explore things more closely and "to question what is shown versus what is possible." He finishes his statement calling circuit-bending "a creative approach rather than a technical process" and saying that it "may not be too dramatic to call it a philosophy." A kind of philosophy that is able to encourage a "deeper consideration and personal reclamation of a world which is fast losing its uniqueness and finding in its place faceless products and manufactured identity."<sup>4</sup>

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<sup>2</sup> For more on that matter, see the posts "Who uses circuitbenders?", "Circuit bent devices used by popular musicians/bands?" at <http://circuitbenders.co.uk>, the entry <http://www.getlofi.com/?p=453>, and also (Tadgh, 2010, p.20).

<sup>3</sup> <http://casperelectronics.com>

<sup>4</sup> <http://casperelectronics.com/circuit-bending/>

## Examples of methodology

Besides the examples of the fathers of the methodology Reed Ghazala and Nicolas Collins, and the above-mentioned Casper Electronics, there are some other projects worth pointing out.

The french duo **10Konekt**<sup>5</sup> (which, in french, sounds like Disconnect), for example, is a free improvisation group formed in 2007 by Jean Christophe Cochard and Cyril Alexandre which has the following motto: "The first recorded sound is always good!" With more than 18 releases available in the internet by different labels, they have a very noisy sounding, with a pinch of punk attitude.

The work of the Dirty Electronics Ensemble<sup>6</sup>, an artistic group created by British John Richards, based on the creation of performances that results from workshops. Richards calls circuit-bending methodology *Dirty Electronics* or *Punktronics*, making clear the connection to the Noise and Punk scenes. His ensemble has already played with key artists and bands such as Merzbow and Throbbing Gristle.

Dutch artist Gijs Gieskes<sup>7</sup> shares the same line of work, but also including an audiovisual approach. In Gieskes' website, it is possible to see a lot of his DIY instruments and observe the aesthetic result of his creations. A nice example is the audiovisual installation ReFunct Media #5<sup>8</sup> (done in collaboration with the benders Benjamim Gaulon, Karl Klomp e Tom Verbruggen) exposed at the Transmediale 2013, when the artists connected a series of discarded audiovisual apparatuses to create a really interesting noisy composition.

frgmnt.org is a Barcelona based collective of artists. Their work relates directly to the Japanese noise music scene and lo-fi aesthetics. Their website presents a series of texts discussing subjects like *Devices* and *Control*, and quoting authors such as Deleuze and Guattari. They conduct workshops, artistic presentations and talks. Most of their work is freely available through the Internet.

Kokeellisen elektroniikan seura<sup>9</sup> (Association of Experimental Electronics) is an important collective of *bricoleurs* with a really strong actuation in the Nordic bending scene. In the documentary Koelse<sup>10</sup>, it is possible to get in touch with a lot of their ideas and their way of working.

In Brazil a rich scene related to Circuit Bending practices has developed over the past decades. Among the most active groups it is noteworthy the work of the collective Gambiologia<sup>11</sup>, that establishes really strong connections with open source and DIY cultures, besides its strong relation to hacker culture.

All of the artists mentioned above exhibit a connection with punk, noise and industrial music scenes, with a more informal approach to the creative process, evidencing a noisier aesthetic that is closer to free improvisation than to electronic music.

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<sup>5</sup> <http://10konekt.blogspot.fr>

<sup>6</sup> <http://dirtyelectronics.org>

<sup>7</sup> <http://gieskes.nl/>

<sup>8</sup> <http://www.recyclism.com/refunctmedia v5.php>

<sup>9</sup> <http://kokeellisenelektronikanseura.blogspot.com.br>

<sup>10</sup> <http://koelsedoc.wordpress.com/eng/>

<sup>11</sup> <http://www.gambiologia.net> - the name Gambiologia makes reference to a brazilian slang: Gambiarra, which is used to refer to things done without proper tools or materials, usually due to lack of these.

Another approach is embraced by such artists as the Spanish Olaf Ladousse<sup>12</sup>, the North-American Tim Kaiser<sup>13</sup> and the Brazilian Panetone<sup>14</sup>. All of them have a more careful work in designing the instruments and a more controlled aesthetic, closer to electronic music, even, in some cases, approaching electronic dance music scene<sup>15</sup>.

## Circuit-bending and DIY culture

By opening their electronic devices and changing the flow of electricity, benders create new uses and possibilities for the devices in their hands, thus establishing a strong connection between circuit-bending and the DIY culture. Ghazala explicitly states this relationship in the following quotation:

My aim, more than a decade ago when I began to write about the DIY of circuit-bending, was to launch new, unique instruments by means of explaining only the general discovery process of circuit-bending instead of using the more standard “this wire goes here” dialogue — a dialogue that usually results in exact duplications of a target instrument. (Ghazala, 2005, p.xiii)

DIY phenomenon is clearly nothing new. Eric Paulos and Stacey Kuznetsov, in *Rise of the Expert Amateur: DIY Projects, Communities, and Cultures*, pose a concise and pertinent definition for DIY:

(...) any creation, modification or repair of objects without the aid of paid professionals. We use the term “amateur” not as a reflection on a hobbyists’ skills, which are often quite advanced, but rather, to emphasize that most of DIY culture is not motivated by commercial purposes. (Kuznetsov and Paulos, 2010, p.01)

DIY is a practice directly related to the rise of Industrial Revolution, generally taken as a reaction to its massive mode of production. It is noteworthy how this movement manifests itself during the modern era. The end of the nineteenth century and the beginning of the twentieth (with its flourishing appeal of science and technology) presented a first glimpse of rebellion against the mass production appeal and led to a boom of inventors and hobbyist activities (together with the *avant-garde* movements, like *futurism*, *cubism*, *dadaism*, and so on).

Model building, photography, high-fidelity audio, all created a vast multitude of technical hobbyists who gathered around specific interests. The fragmentation of the production chain and the alienation of the individual brought about by mass production sparked new interest in manual and craft activities. Hobbyists’ activities played an important social role as they allowed laymen to tackle complex science and technological topics which were shaping the very idea of modernity.

Such activities were organized through magazines, books, clubs, and suppliers. They also entailed connecting hobbyists to a specific social network that helped define their identification with an increasingly homogenized, massive social condition. A remarkable case

<sup>12</sup> <http://www.olafладousse.com>

<sup>13</sup> <http://tim-kaiser.org/>

<sup>14</sup> <http://panetone.net>

<sup>15</sup> This list could carry on enormously, but it is not the intention of this article, for a longer and more complete list see (Fernandez, 2013)

in which audio technology attracted the attention of hobbyists was the radio that was sold in kits for home assembly in the 1920s and 30s.

However, the Second World War and the globalized consumerist model, weakened this hobbyist and amateurist movement for a period of time, imposing a mass consumption mentality throughout most of the western world. This gradual valorization and establishment of mass-production led to the consumerist, hyper-industrial society in which we currently find ourselves. In hyper-industrial society, professionals and specialists can be hired to build, create, decorate, or repair anything, according to market demand. Its logic implies that any product or service might be available at a nearby mega-store, leaving us time to work on our specialized, professional careers and earn money to buy any kind of goods or solutions to our demands.

In music, an initial reaction to such standardizing appears in the Free Jazz movement of the 1960s, with its focus on unrestrained improvisation and the production of records outside the industrial chain, by such associations as AACM (Association for the Advancement of Creative Musicians) and Candid Records. In the 1970s, the Punk movement also emerged as a rebellion against this hegemonic order, bringing DIY to the scene. For these punk artists, ineptitude was seen as virtue: "the creativity that comes from a lack of preconceptions and willingness to try out anything, even if badly" (Hegarty, 2008, p.89). Similar to Free Jazz, punk artists such as Crass, for example, also joined forces to release their records, bypassing the record industry, and criticizing the musical marketplace from a DIY perspective.

In the 1990s, the DIY movement became stronger due to the rave culture and the beginning of the *netlabel* movement, both focusing on independent production (of venues and records). And, in the twenty-first century, with the Internet becoming a vast network of information exchange, the DIY movement expanded, increasing the amount of adherents in several fields: from growing herbs indoors, to producing textiles, knitting and crocheting, to working on different kinds of electronic projects.

Juan Ignacio Gallego Perez, in the article *DO IT YOURSELF: Cultura y Tecnología*, argues that this form of production allows "any person to create, distribute, and promote a product, encroaching upon the basic rules of capitalist society." (Perez, 2009, p.279) He shows that the DIY culture implies three states: an ideological/political one, rebelling against the hegemonic marketing order; an industrial one, searching for new ways of production, outside of mass culture; and an aesthetic one, pursuing singular forms of expression. According to Perez, one of DIY's main goals is to abolish specialization, and one of its characteristics is the breakdown of the lines that separated worker and creator, "along with the possibility that anyone could be a creator, regardless of origin or background." A thinking based on the subversion of the age-old idea of "look before you leap," rather than an attitude based on action -- "first act, then think" --, which he compares to movements like Situationism<sup>16</sup>. He follows by arguing that the DIY movement "changes social relations, creating a community feeling, independent from industry, which seeks to change ordinary mercantile relationships" (Perez, 2009, p.280). Hence, the social order we have just pointed out merits further inquiry.

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<sup>16</sup> Situationism, or Situationist International, refers to an internationalist group of revolutionaries, based mostly in Europe. Their most prominent theoretical work is Guy Debord's *The Society of the Spectacle*.

## General proletarianisation

One key aspect of this social context is what French philosopher Bernard Stiegler calls **General Proletarianisation**, where “human knowledge is short-circuited as a result of its technological reproduction and implementation.” Such movement is amplified by the globalization of the consumerist model, in which not only the know-how (*savoir-faire*) of workers becomes obsolete, but mainly their knowledge of how to live (*savoir-vivre*). That way, citizens “become as such mere consumers: a good consumer is both utterly passive and irresponsible.” (Stiegler, 2010a, p.11)

Stiegler uses the word proletariat in its original meaning, referring to the loss of knowledge of some kind, such as that suffered by factory workers in Marx’s time as a result of their highly specialized functions (condition satirized by Charlie Chaplin in his masterpiece *Modern Times*).

The question of proletariat, though, has very old roots. According to Stiegler, this process did not start with the Industrial Revolution, but at the beginning of mankind and it was already noted, for example, by greek philosopher Plato:

(...) the process of proletarianization marks the beginning of humankind. (...) It is first of all the exteriorization of knowledge in technics. It begins with technics. Now the problem is, what is the gain of the process of exteriorization for humanity? Is it creating heteronomy or autonomy? (Stiegler, 2011, p.37)

Evoking Kant, Stiegler does the following reflection:

(...) if you are reading my books in order to avoid thinking for yourself, out of laziness for instance, you are proletarianizing yourself. (...) Reading books without reflecting upon them and critically engaging with them leads to minority, not maturity. (Stiegler, 2011, p.37)

He argues that the question of proletarianisation is at the origin of philosophy, being, essentially, a question of autonomy versus heteronomy. It is important to clarify that, for Stiegler, pure autonomy does not exist: there is no autonomy without some level of heteronomy.

Besides the remote origins of the concept, the process of proletarianisation is gestated in the midst of the nineteenth century with the creation of modern advertisements and becomes endemic and global after the beginning of the hyper-industrial society. Another key factor in this process occurs in the beginning of the twentieth century when Freud’s nephew, Edward Bernays, invented the basics of marketing by organizing “the captivation of the consumers’ attention, and thus of the libidinal energy that marketing must seek to redirect from the consumers’ primordial objects towards the commodities.” (Stiegler, 2007, p.33-37).

The consumerist model, he says, appears as ways of solving an efficiency crisis in the capitalist order, and was an important step towards hyper-industrial age. The problem is that this model leads to another crisis, that of *libidinal energy*<sup>17</sup>. To captivate this energy source, people are enticed, by marketing strategies, to consume - in order to create a chain of production and consumption. The side effect is that these marketing strategies end up

<sup>17</sup> “industrial life tends to channel individuals’ libidinal potential, that is, their desires, because in order for people to consume objects, it is mandatory that they first want them. But this captivation is destructive, it is a destructive control, as also said in mechanical geniality, meaning that what is submitted to control ends up being destroyed by what it controls. And if we believe, like I do, that we live in the era of the capitalist order that exploits libidinal energy (as it previously exploited fossil fuels, natural resources, etc.) then, hyper-industrial capitalism is on the verge of a serious crisis.” (Stiegler, 2007, p.26)

prevailing, thereby destroying singularity - together with the will to live (the libido). This context obstructs the process of individuation<sup>18</sup>, resulting in a process he calls *disindividuation*: "a process that destroys the collective and destroys culture. And this disindividuation is also a kind of proletarianisation." (Stiegler, 2010a, p.17)

## DIY as de-proletarianisation tactics

Bernard Stiegler sees the processes of de-professionalization of the contemporary era as a possible means of escape from this situation. For him, the revalorization of the *amateur* made possible by digital technology and strengthened by the Internet can create a new *avant-garde* and form new audiences. Nevertheless, he argues that in order for this process of subverting the consumerist mindset to happen, users have to become creators themselves, cease to be simply passive consumers, produce knowledge, and shake the grounds of the capitalist structure.

Circuit-bending (as most DIY culture strategies) encourages *amateurs* to leave the status of passive consumers, and so it can be seen as a de-proletarianisation tactics, as it calls for a "far-reaching process of de-proletarianisation, that is, the recovery of knowledge of all kinds" (Stiegler, 2010a, p.11).

Seen by this prism, circuit-bending (where one can learn how to solder, explore the different electronic components, experiment with electromagnetism, etc.) can appear as a crackle in the consumerist society, since the methodology is based on an experimental approach, a trial-and-error attitude that rebels against buying new hi-tech tools. The goal is the unexpected, neither the perfection nor the efficacy that hyper-industrial society demands from its processes. Benders seek, within this unexpectedness, a genuine learning experience: creation and discovery. When practicing circuit-bending, the primordial aim is not to play the latest hi-tech tool, working only with inputs and outputs in a simplistic way, but rather to experiment, to create something unique.

Circuit-bending, then, is an interdisciplinary artistic methodology, a mixture of electric engineering and music, but also some amount of design, sound art, and performance. Emphasis lies in its procedural character and its focus on the concept. As John Cage says: "the utility of the useless is good news for the artists. For art does not have a material objective. Has to do with changing of minds and spirits." (as cited in Campos, 1998, p.130) The tonic note of circuit-bending is transforming the useless and the expendable into raw material for creation and production, creating singular and unique musical instruments, out of the standardization process of the hyper-industrial society.

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<sup>18</sup> "To individuate oneself is to learn, to experiment, to become what one is by making the passage to the act of a potential that lies within every noetic soul." (Stiegler, 2010a, p.16) and also: "Simondon says that if you want to understand the individual, you need to inscribe the individual in a process of which he is only a phase. As such, the individual has no interests. The individual is only an aspect, or phase of a process, but the process is what is important. So what is this process? It is the process of individuation, that is of transformation, and for Simondon, everything is caught up in and brought into a process of individuation. For example, the passages of life are a process of individuation, but 'technics' are also processes of individuations." (Stiegler, 2010b, p.3)

## Scattering, distraction, diversion

Another key aspect of the social context we believe to be worth discussing here is that of scattering.

According to Vilém Flusser,

Technical images are at the center of society. But because they are so penetrating, people don't crowd around them; rather they draw back, each into his corner. A technical image radiates, and at the tip of each ray sits a receiver, on his own. In this way, technical images disperse society into corners. (...) Media form bundles that radiate from the centers, the senders. Bundles in Latin is *fascis*. The structure of a society governed by technical images is therefore fascist, not for any ideological reason but for technical reasons. As technical images presently function, they lead on their own to a fascist society. (Flusser, 2011, p. 61)

An important issue to the Czech-Brazilian philosopher relating the social scatter provoked by the supremacy of the apparatus is the dissolution of the family. As he puts it: children "who sit in isolation at their computer terminals with their backs to one another have no social awareness. They belong to no family and identify with neither nationality nor class." (Flusser, 2011, p.63) Such tendency is even more evident in our age of smartphones and tablets, with even friendlier interfaces, easily mastered by children. Children's attention, in that context, is no longer in the exterior world, place for real (as opposed to virtual) social interactions, resulting in the loss of their abilities to play with one another, an essential process in acquiring social skills, leading to a great level of scattering.

Flusser does not see this process as a vertical imposition (top to bottom), but as a spontaneous process in modern societies. He states that "people want to be scattered by the images so that they don't have to collect and assemble themselves, as they would if there were in fact a dialogue." (Flusser, 2011, p. 65)

Drawing from Hegel, he argues that communal groups like family and communities possess a clear distinction between the private (in-group) and the public (out-group). Such groups suffer what Hegel called "unhappy consciousness", as they are always aware of losing something depending on their choices ("if I go out into the world, I lose myself in it, and if I go into myself to collect myself, then I am lost to the world"). That is why people choose to be scattered, diverted, in search for a generalized "happiness", a search that overcomes an unhappy consciousness. By breaking the notions of public and private, the scattered individual believes to soothe his consciousness, therefore the will to be entertained and the refuse to concentrate and focus. "Every dialogue is dangerous because it could awaken the unhappy consciousness from its sleep." (2011, p. 65) Flusser, then, describes the consumerist society we live in:

Psychoanalysis describes this happiness as the oral-anal phase; cultural analysis calls this happiness "mass culture." It is happiness at the level of the nursery, intellectually as well as morally and aesthetically. The present dispersal of society can be seen as a move toward this happy twilight condition. (Flusser, 2011, p.66)

We argue that methodologies such as circuit bending (as most of the experimental tendencies in the arts of the late twentieth and beginning of the twenty-first centuries) can act as alternatives to this scattering, zombie-state tendency. For that to happen, it is mandatory for the bender to be conscious that his actuation in the apparatus world always occurs in the form of a game, but that this game can be played according to the intentions and rules of the hegemonic metaprogramming or that these rules can be broken and a new set of rules can rise, seeking to overcome that hegemony. Without such a consciousness, benders tend to

lose the experimental attitude, associating themselves with commerce and capital, losing a great deal of autonomy, in a process of proletarianization and desindividuation, as discussed earlier. That risk is not only present in circuit-bending methodology, but also in all DIY scenes happening in the last 20 years or so.

## DIT - relational aesthetics

The scattering process is probably the main reason why, in recent years, we can observe a tendency in DIY movements: from Do-It-Yourself to Do-It-Together (DIT) or Do-It-With-Others (DIWO).

The issue is that there can be no individuation in the realm of the individual. A process of transindividuation (a wider and more profound process that occurs between distinct individuals) is always necessary for real individuation to happen. As French art curator and critic Nicolas Bourriaud puts it: "the essence of humankind is purely trans-individual, made up of bonds that link individuals together in social forms which are invariably historical (Marx: the human essence is the set of social relations)." (Bourriaud, 2009, p.25)

Stiegler says that the process of transindividuation depends on the creation of circuits which starts as simple processes of co-individuation (a simple conversation, for instance, where both interlocutors are really interested in the subject and produce a sincere exchange of ideas, where both their repertoires are augmented by the dialogue).

He argues that what forges a great artist, a great philosopher, a great person is the fact that such a person is "somebody really specific, singular—somebody who is recognized as a singularity who has created a new type of circuit on which other people can come and continue the circuits." (Stiegler, 2010b, p.4)

That is the importance of this new tendency, where artists begin to work in a more interdisciplinary way, with the collaboration of other individuals, mainly through network technologies. In such collaborative projects, there is an intense exchange of information, building platforms for the creation of new ways of doing stuff. According to John Dimatos, "collaborative projects require a level of humility and understanding of the ultimate mission. Only then do they have the ability to be truly transformative."<sup>19</sup>

Vilém Flusser seems to be describing the tendency towards DIT and DIWO movements when he makes the following statement:

This, I believe, is the project of the new revolutionaries. It is an opposition to the present society, controlled as it is by discursively ordered images. But it is not an attempt to reconstruct any social configuration from the past. Contemporary dispersal cannot be reversed. On the contrary, it requires a new form of assembly. It is high time that our received, consecrated groups fell apart. They were pernicious, ideologically grounded, misery-making groups. Now that they are about to disintegrate completely, new groups can be formed. They can be "informed." The task is to reintegrate a society that has disintegrated into the infinitesimal. Such formulations of contemporary activism are intended to show how firmly contemporary revolutionaries are rooted in the dimensionless universe, on the grounds of hallucinatory, image-producing abstractions. (Flusser, 2011, p.68)

Such a tendency of "doing it together" appears in the circuit-bending scene in two ways: first at concerts, usually performed as a collective free improvisation; and second through

<sup>19</sup><http://www.psfk.com/2010/04/diwo-as-the-new-diy-psfk-conference-good-ideas-on-changemaking.html#!Jvl7o>

workshops, which are very important to most bending groups (both Ghazala and Collins, for instance, are very active instructors).

About the first aspect, the concerts, it is revealing to hear Nicolas Collins' point of view, captured in an interview recorded in São Paulo, just before a presentation of one of his latest performances: *Salvage*. When questioned about his main interests as a composer, he gave the following answer:

I'm interested in those types of chaotic situations and I'm very interested in collective music making. I really like the idea of having twenty or thirty people making music together. But I'm not particularly interested in listening to them play notes on their instruments. (...). So I'm interested in merging this semi-chaotic electronic world with groups of players to create a kind of an improvised electronic ensemble, that has this high degree of chaos and unpredictability in it. And then figuring out ways to sort of shape the performance to give it some kind of form. And that's what this little piece does. (Fernandez & Lima, in press)

In this quotation, it is possible to note his interest in the collective aspect we've been discussing: seeking to get away from the individualistic tendency, electronic music has gotten into (especially when we deal with laptop music or DJing) working in a collective environment of musical production, making it possible for transindividuation circuits to rise.

Another noteworthy example of DIT can be found in the Dirty Electronics Ensemble. According to Richards, "in Dirty Electronics the ethos is not only DIY, but also DIT." His main goal is to "get away from the idea of the solo electronic musician and work in a more fluid and collective way." That way he became less bothered by his own system, and began to think "how a large group could perform a new electronic music repertoire." (Richards, 2011, p.23)

In the documentary *Charge/Discharge*<sup>20</sup>, directed by Andrew Hill, this DIT attitude is made visible. Another key aspect, for Richards, is that the performance not only occurs in the moment of the public presentation of the work, but is already happening during the workshop, when the devices are being constructed by the participants. He avoids talking about the workshop and the performance as two separate moments, since building something in a workshop and playing in a concert are not necessarily separate activities. According to him, in the logic of Dirty Electronics (his way of calling his bent or hacked devices), performance and workshop are part of a "holistic event".

## Relational aesthetics

That aspect calls for our final topic: the discussion of Relational Aesthetics. The term appeared in art criticism in the last years of the 1990s and, as Jacques Rancière suggests, is characterized as "an art creating no more works or objects, but ephemeral situations prompting new forms of relationships."<sup>21</sup> For Nicolas Bourriaud, relational aesthetics takes "as its theoretical horizon the realm of human interactions and its social context, rather than the assertion of an independent and private symbolic space." (Bourriaud, 2009, p.19)

Artists involved in relational aesthetics constitute a "group of artists who, for the first time since the emergence of conceptual art in the mid-1960s, simply do not take as their starting point some aesthetic movement from the past." (Bourriaud, 2009, p.61)

<sup>20</sup> <http://vimeo.com/47413553>

<sup>21</sup> <http://roundtable.kein.org/node/463>

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It is important to notice that for Bourriaud art has always been, in one way or another, relational. The singularity of relational aesthetics consists of putting the relational question in first place and seeking relationships between art and extra-artistic universes. This kind of strategy has been around since the 1960s, and has been resumed by artists in the late 1990s,

(...) but the definition of art, which was central to the 1960s and 1970s, was no longer an issue. The problem was no longer the expansion of the limits of art, but testing art's capacity for resistance within the social field as a whole. (Bourriaud, 2009, p.43)

These artists do not consider intersubjectivity and interpersonal interactions only as "fashionable theoretical gadgets", nor as technical pretexts to an art practice. They consider these elements that allude to the interpersonal relationship "at once a starting point and a point of arrival, or in short the main themes that inform their work." What is produced by them are "relational space-times" which seek to accomplish "interhuman experiences that try to shake off the constraints of the ideology of mass communications", where "alternative forms of sociability, critical models and moments of constructed conviviality" are developed. (Bourriaud, 2009, p.62)

This kind of artistic practice represents a transformation in collective sensibility: from the 1990s on, "the group is thrown against the mass, neighbourhood against advertising, low-tech against high-tech, the tactile against the visual." (Bourriaud, 2009, p.65) But the main change occurred with the end of the modern distinctions between "popular culture" and "high culture".

That been said, we believe it is possible to inscribe some circuit-bending and hardware hacking concerts and workshops as examples of this "relational space-times". After a collaborative and passionate contact with different devices and their programmations (and all the learning that is possible to obtain through them), there is the potential creation of circuits of transindividuation among the participants, as most of these concerts and workshops happen in a really loose manner, inciting people to collaborate and play together and not only to do their own device in an isolated way.

As Ghazala puts it: "that's the beauty of circuit-bending; anyone can do it. You don't need to be an electronics guru or a shop genius. All you need is the ability to solder and to think outside the box. (...) That's pretty immediate!" (Ghazala, 2005, p.3-4)

French philosopher Jacques Rancière argues that "the ordinary becomes beautiful as a trace of the true if it is torn from its obviousness in order to become a hieroglyph, a mythological or phantasmagoric figure." (Rancière, 2009, p.34) We argue that circuit-benders do exactly that: transform an ordinary electronic device into a singular musical instrument, "a truly alien instrument.(...) After all, now in hand is an instrument that exists nowhere else in the universe and that presents sounds no one else has yet heard." (Ghazala, 2004, p.99)

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