Gambioluthiery: Hacking and DIY in Brazil
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Introduction

The popular Brazilian expression gambiarra describes an improvised, informal way of solving an everyday problem when needed tools or resources are not available. Like “hacking” and “DIY” it reflects a way of dealing with the objects and issues that occupy the daily life of post-industrial societies, but gambiarra also denotes specific aspects of Brazilian culture. When applied to visual art, music, sound art and media activism, it describes ways how some artists choose to work with materials, technology and/or local institutions. Activities that reflect gambiarra approaches include instrument building, hardware hacking, cracked media, and other forms of technological activism—all suggestive of a re-envisioning of the musical instrument.

Gambiarra's Genealogy

Originally, in the 19th century, “gambiarra” referred to string lights (fig. 1). The word’s etymology is unclear, but it may have derived from gambia (leg) or from the expression dar às gâmbias, meaning "to run, escape, or flee." Popularly, the word variously means to fix, adapt, improvise or assemble; it can also refer to a handyman, to patchwork, to tricks, and to DIY. By extension it is describes extemporaneous approaches to problem solving; inventiveness, intelligence and creativity. It may also refer to vernacular, autochthonous, popular art. Or, more negatively, it can suggest taking advantage of a situation, or a behavior that is illicit, dishonest or fraudulent. Gambiarra is scruffy, precarious, rustic, crude, ephemeral, palliative, volatile, imperfect and unfinished.

Figure 1 Extension wire with attached lights, gambiarra’s original reference. Photo © Bruno Figueiredo, used by permission.
This spectrum of meanings makes the term adaptable to various contexts. Gambiarra twists the logic of industrial design, establishing short circuits between a product’s form and its functionality. In principle, it emerges from an existing design but, depending on the degree of interference, it can also result in a new design object.

Other cultures sport similar expressions, of course: in Cuba Revolico and rikimbili refer to "technological disobedience," or resistance to the scarcity of material resources and technological access;\(^5\) in Mexico rasquachismo, an artistic movement working within technical and material limitations;\(^6\) in Uruguay chapuza, arreglo temporal (temporary arrangement) and lo atamos con alambre (tie with wire) represent quick and careless execution; solución parche (patchwork solution) in Chile means a kind of temporary amendment; and the Colombian arreglo hechizo or reparación hechiza have connotations similar to gambiarra. The practices represented by these terms reveal varied cultural responses to the practical benefits and limitations of technological product design.

**Local Context: Carnivalization of Technique**

Gambiarra, however, carries distinctly Brazilian associations. The idea of a plural culture that aimed to digest everything that comes from outside, incorporating and re-elaborating elements of global culture in their own way was taken by the artistic movements such as the modernist anthropophagic movement in the 1920s and revisited by tropicalism in the late 1960s.\(^7\) Cultural icons of local culture commonly related to the gambiarra approach include jeitinho, malandragem and the carnival. Perhaps the most iconic manifestation of gambiarra is carnival, with its characteristic freedom of expression and movement, and its subversion and the temporary inversion of the social hierarchy.\(^8\) Carnival’s inside-out, world-upside-down logic does not provide a permanent extinction of hierarchies,\(^9\) instead it dismantles the system of social roles for a short periods.\(^10\) In art and music, gambiarra similarly subverts subject positions and the form-function of designed objects. The consumer assumes a temporary inventor role, moving from passivity to active creation, and imbuing extant products with new uses and purposes. It reverses the order of artifacts, serving as a carnivalization of technique, technology and design.\(^11\)

**Sound and Gambiarra**

Despite radically different cultural contexts, European movements such as Elektronische Musik and musique concrète are similar to gambiarra in their substitution of nontraditional technological tools for traditional ones—for example, using radio transmitters as instruments. Experimental music has other connections to gambiarra: the presence of chance, an emphasis on process and the adaptation of tools such as prepared piano, turntables, or electronic test equipment.

Given gambiarra’s subversion and repurposing of found materials, it is easy to associate it with practices such as circuit bending and hardware hacking. When lack of resources and precariousness are a work’s foundational elements, the risk of failure, glitch and crack is high, as is the need for adaptation and repair. It demands creative openness to error and unplanned occurrences—conditions that permeate cracked media. Likewise, "dirty electronics" emphasize the exploration of invented instruments and prioritize gesture and social interaction.\(^12\) "Dirt" here refers not to substandard quality but to the practice of contradicting technology’s supposedly universalizing character to reveal aspects of the dream that lies hidden in it. Along similar lines, Paul DeMarinis
has proposed rebuilding obsolete and absurd technologies, an activity that resembles gambiarra’s
carnivalization of design.\textsuperscript{13}

**Gambioluthiery**

“Gambioluthiery” is my neologism for the construction of instruments oriented around the logic of
gambiarra, involving activities such as composing, decomposing, inventing, proposing,
constructing, collecting, adapting and appropriating materials, objects, artifacts, devices,
instruments or system setups. As such, gambioluthiery intervenes between the form and the
purpose of objects and devices, resulting in a new instruments, artworks and experiences.
Gambioluthiery works in peripheral zones pre- or post- musical instrument, between the audible
and visible, between musical performance and sound installations, and between musical projects
and sound design. Exploiting sound beyond the syntax of traditional musical instruments, it
emerges from a tension within the concept of a musical instrument and its material context. The
boundaries between utilitarian object and instrument are confused, dynamic and unstable in
gambioluthiery. It can be thought of as a practice of Tato Taborda’s concept of "technology without
the edges"\textsuperscript{14}, established via an upending of hierarchies between high and low technology or even
between composer and interpreter.

The history of musical instruments is rife with overlaps between everyday tools and musical
devices. Consider what unites and separates blowpipe and flute; the stretched rope of a bow and
arrow and the string on a berimbau; a crate and a cajón; or a grater and a guiro. What distinguishes
the mouth that eats from the mouth that speaks and sings? Gambioluthiery reconnects instrument
and utilitarian object.

Gambioluthiery reinforces connections between sound and its materiality as well as the paradoxical
gaps between advantage and limitations that techno-consumption produces globally. While I use the
term to refers to a particular Brazilian repertoire (examples described below), it can be seen more
broadly in the idea of expanding the musical instrument through sound art.\textsuperscript{15}

**Repertoire**

A precursor on the route toward gambioluthiery is the Brazilian composer, cellist and luthier Walter
Smetak (1913–1984), whose search for a new music was entwined with his invention of instruments
meant to extend musical boundaries. Smetak’s musical and spiritual journey is summarized by the
wordplay he used to describe the instrument as an object or vehicle that instructs minds: "instru- to
instruct; ment- to mind. Instruct minds."\textsuperscript{16} From experimental luthiery to “plásticas sonoras” (sound
plastic), extrapolated music proposed other spaces and methods for experiencing sound
(installations, sculptures, objects and actions), which would later be defined as sound art.\textsuperscript{17}
Several of Smetak’s instruments make gambiarra-like use of available materials. These include Piston Cretino (1976), comprising an aluminum kitchen funnel, plastic hose and piston nozzle, and the 1972 Bicho (figure 2), springs, gourds, wires, spirals, wooden cables and metal bars that are coupled to a wooden base with pickup that amplify the noises and friction of objects. There are kinetic instruments such as the 1971 Treis Sóis (wood, metal, Styrofoam and PVC pipe); collective instruments such as the 1973 Pindorama (a 2.2-meter-high wind instrument made of gourds, plastic tubes, bamboo, PVC pipe, wood and metal), and Bicéfalo (figure 3), two guitar arms intertwined over pieces of wood with two pickups attached; and plásticas sonoras such as Caosonância (1972), rectangular metal tray with stones surrounded by barbed wire, metal wire that holds several gourds forming an upward spiral around a long vertical bamboo rod that has on top a wind wheel.

Smetak’s work influenced other Brazilian musicians and sound artists – both those who had direct contact with him, including the tropicalist Gilberto Gil (figure 3), as well as those who didn’t, such as Tato Taborda (figure 4) and Vivian Caccuri (figure 5), among others.
**Figure 3** *Bicéfalo* (1974), Gilberto Gil's conception and constructed by Walter Smetak. Two guitars, pickups. Photo © Ass. Amigos Walter Smetak, used by permission.

**Figure 4** Tato Taborda, *Geralda* (1988-2001), multiple sound sources. Photo © Tato Taborda, used by permission.
In the early 2000s Brazilian artists were using the term gambiarra to describe bricollage, an objet trouvé, or a ready-made creative process that engaged different materials, media and artifacts. In sound art, Chelpa Ferro describes gambiarra instruments as "half adapted, constructed in a way ... [and] the sound is also half limited, half raw," while Paulo Nenflidio describes gambiarra as a process he used in creating his piece *Polvo* (2010) "to modify an original function of these materials," Similarly, the sound art duo En Minus One (n-1) explain that “adapting, hacking, building, programming, improvising, pirating and appropriation were all part of” their process.

More broadly, in the discourse of visual and media art it was pointed out that the interest in "establishing relations with a political and aesthetic accent" was a feature of Brazil’s technological culture.

Inspired by Cage’s “Imaginary Landscape no. 4” (1951), Nenflidio created in 2006 *Decabráquio Radiofônico* (figure 6) which plays ten radios simultaneously. His 2003 work *Berimbau Elétrico* adapts traditional and nontraditional instruments to an electric context, while his *Bicicleta Maracatu* (2000) accommodates mechanisms of movement. In other pieces he has used gadgets such as...
electric razors and solenoids, or his own electromechanical mechanisms such as Lugares Sonoros: Teclado Decafônico Concreto (2005). Each key on this portable wooden keyboard activates an electromagnetic coil and wooden hammer connected by long cables to different points in the space—a steel beam, trash can, fire extinguisher, etc. The acoustic result derives from characteristics of the objects that are hit and of resonance of the space in which the system is installed.

Figure 6 Paulo Nenflidio, Decabrásquio Radiofónico (2006), keyboard, wood, electronic circuit, radios, speakers. Photo © Paulo Nenflidio, used by permission.

Chelpa Ferro’s 2009 work Samba uses a table with a sewing machine on one side, a fishing reel on another and a snare drum in the middle (figure 7). The reel connects to the sewing machine through a fishing line stretched. When the machine is turned on, the line hits the snare drum, creating a rhythm similar to that of the samba. The result is a regular and un-regular rhythm with occasional faults, creating a noisy oscillation that adds to the sewing machine noise and spool gears picked up by microphones placed in each source (drum, reel, machine). "Samba is treacherous,” writes Caccuri about Chelpa Ferro’s work, “a machine that wants to have swing (ginga), a kind of gambiarrâ that wants to be precise."22 Here we see the gambioluthiery characteristics of assemblage, bricolage, trickery, sonorous visual installation, and the unstable procedural rhythm that juxtaposed mechanisms generate.

Another work that exemplifies gambioluthiery as an expanded sense of the musical instrument is Tato Taborda’s Geralda (1988-2001) (figure 4). A mix of multi-instrument and electroacoustic orchestra, Geralda is essentially a one-man-band instrument, where the player activates more than 70 sound sources using hands, elbows, knees, head and feet.23 Originally designed in 1992-1993, the instrument continued to evolve over the next decade as Taborda added sound layers and incorporated or abandoned materials and devices. It began with instruments and acoustic objects, to which he later added microphones (1998-1999) and live electronics (2001). "All the technology used in Geralda has a gambiarrâ way of being,” Tabora says. “It's rounded. It's technology without the edges."24 With its three species of sound — acoustic, electric and digital) — Geralda embodies one possible taxonomy of gambioluthiery.


7 With allusions to the historic practice of cannibalism by Brazilian aborigines, the anthropophagic movement proposed by the poet Oswald de Andrade in his *Manifesto Antropófago* (Cannibalist Manifesto) defended a plural culture that aimed to digest everything that comes from outside. See Oswald de Andrade, *Manifesto Antropófago* Oswald Andrade. Manifesto Antropofágico. Em Piratininga ano 374 da deglutição do Bispo Sardinha. In: Revista de Antropofagia 1.1 (1928)

8 These cultural aspects are discussed in Obici [1] and Rosas [2].


11 In Dicionário Houaiss [3], carnivalization is described as "based on a mixture of diverse elements in which the rules or patterns (social, moral, ideological) commonly followed are subverted or set aside, in favor of stimuli, forms and contents more linked to instincts and senses, to the expansion of laughter and sensuality. Or 'condition of something that has such a mixture'" (my translation). The concept was invented by the Russian literary critic Mikhail Bakhtin (1895–1975).

12 Richards [2].


14 Interview made with Tato Taborda, Berlin, 2013 (personal author records).

15 See Obici [1].


See: Lagnado [2] and Rosas [2].


Geralda is similar to Acustica (1968-1970) and Zwei-Mann-Orchester (197173) by Mauricio Kagel (19312008), in which the instrumentation is a huge array of sound sources, a world of exotic instruments and almost surreal invention.

See [14].