Gambioluthiery

Revisiting the Musical Instrument from a Bricolage Perspective

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ABSTRACT

Gambiarra is a popular Brazilian expression that describes an improvised and informal way of solving an everyday problem when needed tools or resources are not available. Since the turn of the 21st century, the term *gambiarra* has been a part of Brazilian art discourse. This article first analyzes the genealogy of the word *gambiarra,* including its global and local contexts, and then looks at the use of *gambiarra* in the production of music and sound art instruments, or *gambioluthiery.*

The expression *gambiarra*, as applied to art, broadly describes an improvisational method of working with materials, devices, technology and/or institutions within the local art scene in Brazil [1]. The term encapsulates productions from visual arts to music [2] to sound art to media activism [3] and it includes diverse practices and trends, such as DIY ("do-it-yourself"), instrument sound design, circuit bending [4], hardware hacking [5], dirty electronics [6], cracked media [7], opera technology [8], residualism [9] and technografic marking [10]. By reinforcing the connections between sound and materiality, each of these terms suggests a reenvisioning of the musical instrument. Later in this article, we look at the application of *gambiarra* to the production of musical instruments, but first, we examine *gambiarra*'s genealogy and its global and local contexts.

GAMBIARRA'S GENEALOGY

Originally (1881), *gambiarra* referred to string lights, or extension wire with attached lights [11]. From the practice of illegally installing electrical cables by climbing a pole "like a cat" comes the expression *fazer um gato*, or "to make a cat," which became synonymous with an illegal solution to a problem (Fig. 1). *Gambiarra*'s etymology is less clear, but it may have derived from *gambia*—a human or animal leg—or

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from the expression *darn às gâmbias*, meaning "to run, escape, or flee" [12].

Popularly, the word *gambiarra* variously means to fit, fix, repair, mend, adapt, improvise or assemble; it can also refer to a handyman, to patchwork, to tricks, or to DIY. Alternatively, it may describe any of the following: an unconventional approach to problems involving inventiveness, intelligence,

Fig. 1. Illegal electricity extensions on a pole, also called *gambiarra.* (Photo © J.P. Oliveira)

creativity and the ability to come up with extemporaneous solutions to problems; an uncommon, unusual practice; vernacular, autochthonous, popular art; the act of taking advantage of a situation; or an irregular, illicit, dishonest, marginal, illegal or fraudulent custom. *Gambiarra* is scruffy, precarious, rustic, rough, crude, ephemeral, palliative, volatile, informal, inadequate, imperfect or unfinished [13].

This broad spectrum of meanings makes *gambiarra* a flexible and adaptable term across various contexts and involving diverse ways of working with objects and technologies. *Gambiarra* twists industrial design logic, 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.

GLOBAL CONTEXT

Gambiarra is related in meaning to some English words that are used in the context of improvisation, adaptation, creative problem-solving and autonomy, such as hacking, kludging, jury-rigging, workarounds, do-it-yourself and makeshift. Like *bricolage*, as described by Claude Lévi-Strauss, the idea of *gambiarra* arises from the logic that "something can always be used for something," thereby privileging collected or found elements and eschewing preconceived plans [14]. Diverging far from the processes and norms adopted by "instrumental technical thought," the *bricoleur* uses fragmented or prefabricated materials to carry out projects.

Gambiarra is also close in meaning to several other popular global expressions. *Revolico* and *rikimbili* in Cuba refer to "technological disobedience," or resistance to the scarcity of material resources and technological access [15]; in Mexico *rasquache* designates art that reflects the ghetto attitude *rasquachismo*, an artistic movement working within technical and material limitations [16]; in Uruguay, *chapuza*, *arreglo temporal* ("temporary arrangement") and *lo atamos con alambre* ("tie with wire") represent quick and careless execution; *solución parche* in Chile means a kind of amendment or temporary solution; in Colombia *arreglo hechizo* or *reparación hechiza* have connotations similar to *gambiarra*; *desenrascar* in Portugal is a creative, unorthodox process that nevertheless produces a solution. In India, Pakistan and some African countries, *jugaad* refers to the assembly of low-cost vehicles and provisory solutions. And out of the informal markets that emerge in the context of precarious economic development come the terms *jua kali* in Kenya and *zizhu chuangxin* in China, terms that have connotations akin to *gambiarra*.

TECHNOLOGY WITHOUT EXTREMES

The diverse practices represented by these terms reveal a global culture based on the benefits, but also the limitations, of techno-products as residual effects of product design. In a world mediated by object paraphernalia—artifacts, gadgets, interfaces, operational systems, applications and various technological devices and accessories—people share products as well as attendant modes of subjectivity, utopias and

dystopias. This paradoxical gap between the advances and limitations of techno-consumption is described by cyberpunk writer William Gibson in terms of high technology and precarious life, "high tech and low life" [17]; likewise, Nam June Paik regards anti-technological technology as an "electronic humanization" [18] or even a search for the primordial music (Fig. 2).

Fig. 2. Nam June Paik, *Urmusik*, 1961, wooden box, wire, various materials, can, 1961. (© Estate of Nam June Paik) *Urmusik* is a German term meaning "ancestral or primordial music."

Neither low nor high technology, *gambiarra* is closer to being a "technology without extremes" that combines archaic techniques with modern machines [19]. Beyond identifying creativity and invention as ways to overcome restrictive conditions, *gambiarra* subverts polarized logic and discourse. It sits in between and on the edge. Marginal and anti-nostalgic, it gravitates toward analog technologies or optimistic approaches to new technological and/or digital currents.

Despite its similarities with other global terms, *gambiarra* carries distinct local characteristics. It is relevant within Brazilian artistic movements such as the 1920s modernist anthropophagic movement [20] and tropicalism in the late 1960s [21]. Cultural icons of local culture commonly related to the *gambiarra* approach include *jeitinho*, *malandragem* and the *carnival;* the latter is used to illustrate it below [22].

LOCAL CONTEXT:
CARNIVALIZATION OF TECHNIQUE

Characterized by freedom of expression and movement, *carnival* has a central theme of subversion and temporal inversion of social hierarchy. Characterized by "inside-out" and "world-upside-down" logic, it does not equate with hierarchical extinction but rather with a controlled and temporary experience [23]. It dismantles a system for a short period, playing with the possibility of upending social roles [24].

Like *carnival*, *gambiarra* subverts subject positions and the form-function of design objects. The user assumes a temporary inventor role, imbuing artifacts with other uses and purposes and moving from being a passive consumer to being an active creator. If *carnival* is a provisory term for

social roles, *gambiarra* is an ephemeral solution. *Gambiarra* reverses the order of artifacts, serving as a carnivalization of technique [25], technology and design.

SOUND AND *GAMBIARRA*

What would *gambiarra* be in the context of music and sound? Despite their different cultural contexts, *Elektronische Musik* and *musique concrète* are similar to *gambiarra* regarding the substitution of nontraditional technological tools for traditional ones—such as using radio transmission devices as instruments to compose music. Experimental music has further connections to *gambiarra*: the presence of chance, an emphasis on process and the adaptation of tools such as prepared piano or different media devices.

Gambiarra in music lies between "playing within the rules" and "playing to subvert the rules" of a musical system. It's similar to hacking. As Richard Stallman, founder of the free software movement, wrote, the "1950s 'musical piece' by John Cage, *4'33"* [which has no notes] is more of a hack than a musical composition" [26].

Given *gambiarra*'s primary concerns with subversion and repurposing, it is easy to associate it with musical practices like circuit bending and hardware hacking. In these practices, electronic circuits are manipulated using cables and jacks to alter the energy flow, producing sounds far different from their original design. The resulting sounds, as well as the formal interfaces, are altered, creating "alien instruments" [27].

When lack of resources and precariousness are a work's foundational elements, the need for adaptation and repair—as well as the risk of failure, glitch and crack—is high. This implies a 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 [28]. "Dirt" and "lack" here refer not to substandard quality but rather to the practice of contradicting technology's supposedly universalizing character to reveal aspects of the dream that lies hidden in technology. Along similar lines, Paul DeMarinis proposed rebuilding obsolete and absurd technologies [29], a proposal that resembles *gambiarra*'s "technology without extremes," or the carnivalization of design.

GAMBIOLUTHIERY

Gambioluthiery is my neologism formed by the prefix *gambio-* (from *gambiarra*) and *luthiery* (construction of instruments) [30]. It refers to construction of instruments oriented around the logic of *gambiarra,* which involves 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 instrument, performance, intervention, action, music, sound file, installation or sculpture.

Gambioluthiery works in a peripheral zone, pre- or post-musical instrument [31], between the audible and visible, the musical and the sound arts, the performance and the installation and even between musical project and sound design. By exploiting sound without necessarily drawing from the syntax of traditional musical instruments, its practice does not necessarily exist outside music but rather 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*. In this peripheral zone, *gambioluthiery* can also be thought of as a practice of "technology without extremes" [32], established via an upending of hierarchies between high and low technology or even between composer and interpreter.

Reviewing the history of certain musical instruments, one notes the blurred lines that separate an everyday tool from its use in a musical context. Consider what unites and separates blowpipe and flute; the stretched rope of an arch and arrow and the monochord, lyre or berimbau; ceramic vessel and percussion instrument; calabash with seeds and matchbox shaker; wooden box and flamenco cajón; or grater and guiro or *reco-reco*. What distinguishes the mouth that eats from the mouth that speaks and from the mouth that sings? *Gambioluthiery* reconnects with this broad overlap of instrument with 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 the term refers locally to a particular Brazilian repertoire [33]—examples of which are described below—it enhances a general tendency of expanding the idea of the musical instrument through sound art.

REPERTOIRE

A precursor tracing the route toward gambioluthiery is the composer, cellist and luthier Walter Smetak (1913–1984), whose search for a new music came from his invention of instruments meant to extend musical boundaries. This search defined Smetak's musical and spiritual journey, synthesized 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" [34]. From experimental luthiery to *plásticas sonoras silenciosas* ("silent sound plastic") [35], extrapolated music proposed other spaces and methods for experiencing sound (installations, sculptures, objects and actions), which would later be defined as sound art [36].

Several of Smetak's instruments can be related to *gambiarra* by his use of available materials: *Piston Cretino* (1976), comprising aluminum kitchen funnel, plastic hose and piston nozzle; *Bicho* (Fig. 3); *Disco Voador* (Fig. 4); kinetic instruments like *Treis Sóis* (1971), made with wood, metal, Styrofoam and PVC pipe; collective instruments such as *Pindorama* (1973), a 2.2-meter-high wind instrument made of gourds, plastic tubes, bamboo, PVC pipe, wood and metal; and even *plásticas sonoras silenciosas* like *Caosonância* (1972)—to name a few.

In the early 2000s Brazilian artists were using the term *gambiarra* to describe a *bricoleur*, an *objet trouvé*, or a ready-made creative process that engages different materials, media
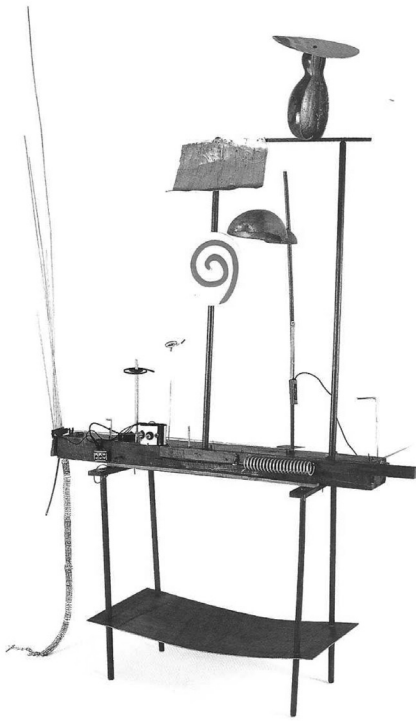
Fig. 3. Walter Smetak, *Bicho*, springs, gourds, wires, spirals, wooden cables and fine metal bars that are coupled to a wooden base with pickup that amplifies the noises and friction of objects, 1972. (© Ass. Amigos Walter Smetak)

Fig. 4. Walter Smetak, *Disco Voador*, wooden base, metal rim, strings, metal disc, two metal rods, Styrofoam box as resonator, 1974. (© Ass. Amigos Walter Smetak)

and artifacts. In the field of sound art, Chelpa Ferro describes *gambiarra* instruments as "half adapted, constructed in a way . . . [and] the sound is also half limited, half raw" [37]; Paulo Nenflidio describes *gambiarra* as a process he used in creating his piece *Polvo* (2010) "to modify an original function of these materials" [38]; similarly, the sound art duo En Minus One (n-1) explains that "adapting, hacking, building, programming, improvising, pirating and appropriation were all part of the process" of their work [39]. In addition, *gambiarra* was present in the local discourse of visual and media art; it was pointed out that the interest in "establishing relations with a political and aesthetic accent" [40] was a feature of its technological culture [41].

Inspired by Cage's piece *Imaginary Landscape no. 4* (1951), Paulo Nenflidio (1976–) created *Decabráquio Radiofônico* to simultaneously play ten radios (Fig. 5). Nenflidio works with fragmented elements, starting from ideas, pieces of music, performance situations or interactive installations. As something between instrument and installation, Nenflidio's work is a hybrid ins(trumen)tallation, as the term *gambioluthiery* suggests. He adapts traditional and nontraditional instruments to the electric context, as in the case of *Berimbau Elétrico* (2003), or to mechanisms of movement, as in *Bicicleta Maracatu* (2000); or he uses existing devices: electronic gadgets such as razors (solenoids) or electromechanical mechanisms such as hammers or PVC pipe (*Teclado Sísmico*, 2008). Nenflidio's works exist somewhere between
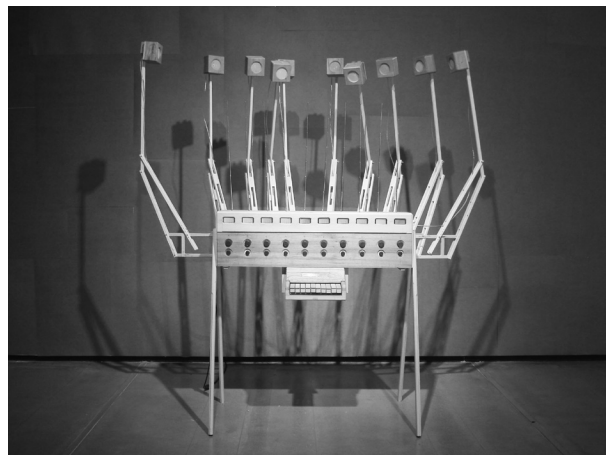

Fig. 5. Paulo Nenflidio, *Decabráquio Radiofônico*, keyboard, wood, electronic circuit, radios, speakers, 2006. (© Paulo Nenflidio)

"handmade contraptions" and "design products"—a realm in which the work of inventor, luthier and sculptor merge.

Chelpa Ferro's work *Samba* (Fig. 6) uses a table with a sewing machine on one side, a fishing reel on another and a snare drum in the middle. The reel connects to the sewing machine through a fishing line stretched over it. When the machine is turned on, the line hits the snare drum, creating a rhythm similar to that of the samba. Due to the line's
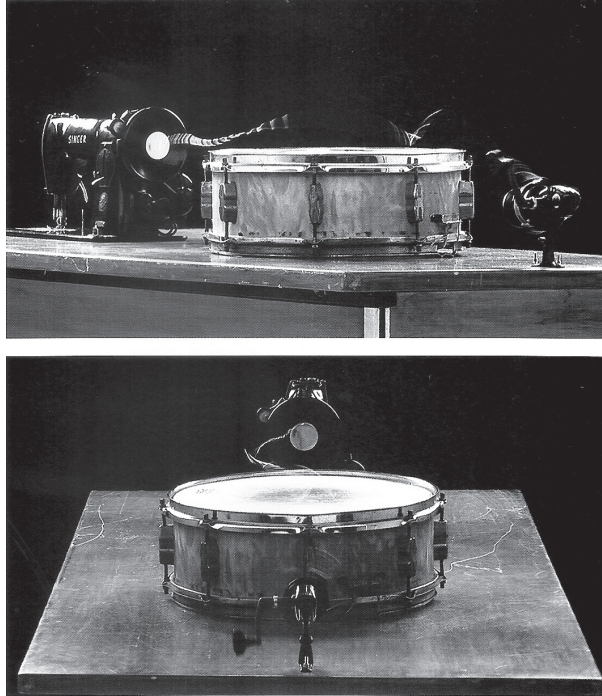
Fig. 5. Chelpa Ferro, *Samba*, table, sewing machine, fishing reel and line, snare drum, 2009. (© Chelpa Ferro)

Fig. 5. Tato Taborda, *Geralda*, multiple sound sources, 1988–2001. (© Tato Taborda)

malleability, the sewing machine motor produces a 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). The swing is not very convincing, because the source is a machine: "*Samba* is treacherous: a machine that wants to have swing (*ginga*), a kind of gambiarra that wants to be precise" [42]. Some features of this work are related to *gambioluthiery*: 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 *Geralda* (Fig. 7).

A mix of multi-instrument and electroacoustic orchestra created by Tato Taborda (1960–), *Geralda* is essentially a one-man band instrument, where the player activates more than 70 sound sources using hands, elbows, knees, head and feet [43]. Designed in 1992–1993, the instrument continued to evolve over the next decade as Taborda added sound layers and incorporated or abandoned materials, instruments and devices. It emerged as an exclusive project based on instruments and acoustic objects, which were later microphoned (1998–1999) and in 2001 incorporated live electronics. Over its trajectory, *Geralda* accumulated three layers of sound (acoustic, electric and digital), suggesting a possible taxonomy for gambioluthiery.

References and Notes

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16 P. Zavella, "Beyond the Screams: Latino Punkeros Contest Nativist Discourses," *Latin American Perspectives* (2012) p. 30.

17 According to David Ketterer, "The overall feel of Gibson's cyberspace works with their low-life ambiance;" D. Ketterer, ed., *Canadian Science Fiction and Fantasy* (Bloomington: Indiana Univ. Press, 1992) p. 143.

18 W. Herzogenharath, *Nam June Paik: Fluxus—Video* (München: Verlag Silke Schreiber, 1983) p. 116: "Ich möchte die Elektronik humanistischer, bewusster für die Problematik der darzustellenden Realität und diese sichtbarer machen. Ich liebe die anti-technische Technologie."

19 As composer Tato Taborda described his multi-instrument, *Geralda* (see Fig. 7), "All the technology used in *Geralda* has a *gambiarra* way of being. It's rounded. It's technology without the edges" (interview with T. Taborda, Berlin, 2013).

20 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," in *A Utopia Antropofágica: Obras Completas de Oswald de Andrade* (São Paulo: Editora Globo, 1990 [1928]).

21 *Tropicalismo* exposed the contradictions of modernity in Brazil: On the one hand, the capitalist development and strong urbanization of the 1950s and 1960s (including construction of the capital, Brasília) fueled Brazil's optimism; on the other hand, Brazil was still haunted by its position of underdevelopment and economic disadvantage in relation to Europe and North America: F. Süssekind, "Chorus, Contraries, Masses: The Tropicalist Experience and Brazil in the Late Sixties," in *Tropicália: A Revolution in Brazilian Culture* (São Paulo: Cosac Naify, 2005) pp. 31–58.

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28 Richards [6].

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30 Although *luthiery* normally refers to the making of stringed instruments, I use it here to describe the construction of instruments in general.

31 See John Bowers on an "infra-instrument": "something less than an instrument." J. Bowers, "Suborderly Music: The Victorian Synthesizer, Ohm-My-God and Infra-Instruments" (24 March 2007): <www.suborderly.blogspot.com.br/2007/03> (accessed 20 May 2017).

32 Interview with Taborda [19].

33 See Obici [1].

34 W. Smetak, *A simbologia dos instrumentos* (Salvador: Omar G., 2001 [1980]) p. 41.

35 According to Marco Scarassatti, "*Plástica Sonora Silenciosa* expands the field of music to the context of space and visuality. The sound is materialized in its own plastic form." See M. Scarassatti, *Walter Smetak: O alquimista dos sons* (São Paulo: SESC-SP/Perspectiva, 2008) p. 98.

36 Douglas Kahn notes that artists utilized different terms such as radio art, audio art and sound art between 1970 and 1980. See D. Kahn, "The Arts of Sound Art and Music" (2005): <www.douglaskahn.com/writings/douglas_kahn-sound_art.pdf> (accessed 10 September 2016).

37 F. Manata, "Podcast 06 Chelpa Ferro," *Arte Sonora* (2013): <www.exst.net/artesonora/podcasts/pod-06-chelpa-ferro/2013> (accessed 21 December 2016).

38 P. Nenflidio, *Gambiólogos: A gambiarra nos tempos digitais* (Belo Horizonte, Brazil: Kludgists, 2010) p. 12.

39 G. Obici and A. Fenerich, "Jardim das Gambiarras Chinesas: Uma prática de montagem musical e bricolagem tecnológica," *Encontro Internacional de Música e Arte Sonora* (Juiz de Fora, 2011). For more information about En minus One (n-1), see <www.n-1.art.br>.

40 Lagnado [2].

41 Rosas [3].

42 V. Caccuri, "Ouvindo as artes visuais: Sonoridades de Waltercio Caldas, Cildo Meireles, Chelpa Ferro e Hélio Oiticica" (Master diss., Universidade Federal do Rio de Janeiro, 2011) p. 58.

43 *Geralda* is similar to *Acustica* (1968–1970) and *Zwei-Mann-Orchester* (1971–73) by Mauricio Kagel (1931–2008), in which the instrumentation is a huge array of sound sources, a world of exotic instruments and almost surreal invention.

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