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## CHAPTER 36

# Handmade Sound Communities

LISA KORI AND DAVID NOVAK

### FROM DO-IT-YOURSELF TO DO-IT-TOGETHER

In the decade since *Handmade Electronic Music* began to worm its way around the globe, clusters of handmade audio enthusiasts and collectively organized projects have formed in a broad geographical swath of sound art and electronic music scenes. Some were directly inspired by Collins's approach to hardware hacking, taking up new experiments enabled by the proliferation of handmade audio schematics online; others assembled projects from scrap electronics and readily available components, inspired by hands-on learning from like-minded creative souls. Participating in handmade audio practices has altered the lives of many artists and musicians and laid the groundwork for new community and collective praxes in electronic sound arts.

Home electronics have a long history in “do-it-yourself” (DIY) hobbyist practice, through which individuals take control of the invention and construction of technologies, creating alternatives to corporate production and the creative limits of consumer design. However empowering to the individual, the DIY ethos can reinforce the misleading ideal of singular innovations created by isolated individual geniuses in a linear progression of new objects and styles. Although we know better, new art and technology can seem to emerge *sui generis* in the contributions of solitary heroic creators, who break the rules all by themselves. It is a short leap from imagining the invention of counterpoint in Bach's mind to lionizing Steve Jobs cooking up Apple in his parents' garage or ascribing the invention of analog synthesis to Bob Moog and Don Buchla.

This chapter reconsiders the history of handmade electronic music not as the product of discrete independent actors but as a global network of collective activity, based in interactive workshops that serve many different social and aesthetic goals. One way to understand the art of hardware hacking is as a social and sonic practice of community building, in which people “do it *together*” (DIT) in groups that bring different abilities, needs, skills, and worldviews together to generate new forms of experimentation. We are especially concerned with how DIT electronic sound communities have developed among groups that are under- or unrepresented in existing histories of electronic music and experimental sound arts and whose access to electronic infrastructures has

taken varied forms, both within and outside the West. We draw on our ethnographic fieldwork as well as interviews with international collectives, including:

- Sound-making communities in the Global South, particularly Brazil and Indonesia.
- Organizations oriented toward a diverse cultural field of participants, especially practitioners of sound technology who identify as female or non-binary in gender.
- Collectives that align technological learning with the social politics of community outreach, education, and accessibility.
- Spaces that build community through musical experiences, and an attempt to resist financial pressure to commodify cultural practices.

In addition, we include parallel innovations in popular culture that are often excluded from institutional narratives of electronic music and sound art: guitar feedback, pedal boards; DJing and turntablism, pause tapes, and beatmaking; experimental sound in film and video; performance art, social criticism, and independent media projects.

As Brazilian sound artist, experimental musician, and arts organizer Vanessa De Michelis explains, circuit bending has had an impact in creating new community approaches to art, technology, and cultural politics (Figure 36.1):

[By] developing electronic circuits, they found a way of bending other things. Firstly, they bent the precarity of their conditions of access to electronic parts and equipment and the black box of technology. But secondly, and more importantly, they found a way of bending their isolation in the hegemony of Northern hemisphere voices that dictate aesthetics and ways of being, and created a circuit of long lasting friendships that bent the notions of what a noise community and circuit should do, and look, and sound like.<sup>1</sup>



Figure 36.1 Azucrinoise Workshop at SESC Belenzinho 2011, led by Vanessa De Michelis and Manuel Andrade.

Photo credit: Manuel Andrade.

The function of building and bending circuits is twofold: circuits form the basis of sound objects that open up and subvert the expected use of a technology, but they also build social connections between people who are willing to explore collective techniques of creating, living, and being together. Handmade sound communities reframe the exchange values of artistic activity, turning away from the production of commodified objects toward shared contexts of learning that highlight new possibilities for technological creativity in a global society.

## **WORKSHOPPING COMMUNITY: HACKING THE OBJECTIFICATION OF ELECTRONIC SOUND**

In many handmade electronic audio communities, the teaching/learning workshop plays a central role. Hacking workshops use sound technologies to generate new social relationships and new ways of thinking creatively in everyday contexts. Since building, modifying, and bending circuits is a tactile process, one of the best ways to share and disseminate knowledge is in workshops that present basic skills, such as soldering and circuit building, or that focus on the creation of a particular sound tool or electronic object. Workshops can sometimes provide artists a source of income tied to their music or sound art practice and offer a flexible and open-ended model for educators to connect art and technology for practitioners less experienced with electronics. More often, however, these are collectively organized tuition-free or sliding-scale events that do not emphasize a particular pedagogy or instructor and move away from lecture-based instruction to generate critique in more open experimental models. Many workshops foreground ethical questions of living with technology while also creating opportunities for members of the public to acquire technological literacy in their artmaking by literally opening up everyday electronics otherwise “black-boxed” in consumer audio products. Because circuit-bent instruments “have often been built from junk, and/or mess with the innards of mass-produced consumer products,” Trevor Pinch argues, they “mount a challenge to the mass-consumer society of modern capitalism and its deleterious environmental effects.”<sup>2</sup> Nozu Kanami of the Osaka-based group Destroyed Robot describes his bent noise machines as manifestations of *hanzoku waza* (rule-breaking techniques) that resist the flattening effects of mass-market technologies: “Tamiya [an electronics hobbyist company] has this huge contest, but they have this rule that you can’t enter unless you use genuine parts manufactured by Tamiya. That’s what I mean. . . . I think many Japanese toys hinder creativity. And I think it’s wrong for people to be satisfied with such toys.”<sup>3</sup> In learning how to take apart such objects, hardware hackers unlock new ways of thinking about what, and who, makes musical sound.

For many groups, hardware hacking shifts the focus of music technology from inventing new products to exploring processes of improvisation and emergence with existing materials. This emphasis on transitory events rather than fixed objects suggests an alternative politics of social aesthetics that challenges the commodity form of art. The larger goal is not so much the specific artworks produced as the ongoing social process of sharing knowledge and skills. Waft Lab, based in Surabaya, Indonesia, sponsors circuit-bending events such as a “Fun with Knobs” workshop, intended to reach

students and musicians who might not ordinarily approach consumer technologies with a spirit of openness and experimentation (“Art is fun, art is easy . . . how great it felt when we were kids who played with the diverse sound of the universe!”) (see Figure 36.2).<sup>4</sup> Similarly, the pioneering BENT festival provided many musicians in early 2000s New York City with their first taste of cracking open a children’s toy and unleashing a torrent of uncontrollable sounds. These sounds arose from assemblages of broken junk not easily categorized as either artworks or musical instruments. The experimental and hands-on nature of handmade audio workshopping stresses the outcomes of creative labor as ongoing and adaptive processes that, in turn, feed back into community building.

Beyond functioning as sites of learning and exchange, workshops and collectives can perform important social functions, bridging gaps in regional infrastructures and fostering new forms of local culture. House of Natural Fiber (HONF), an arts



Figure 36.2 Waft Lab Tadarus Workshop poster. Caption: “While you’re waiting for dawn [to break your fast], let’s share and spread the spirit of Ramadan with Do It Yourself! Let’s reflect on the importance of this process, of making electronic devices and continuing to refine them.”

collective based in Yogyakarta, Indonesia, developed a project called *Intelligent Bacteria: Saccharomyces Cerevisiae* (2011) in which the group made wine out of Indonesian fruits and built circuits to amplify the tiny noises of the CO<sub>2</sub> bubbles created during fermentation. While *Intelligent Bacteria* was a successful art installation, winning the prestigious Transmediale Award the same year, it began as a research project to explore the social ramifications of a recent alcohol tax that had led to the making and selling of deadly methanol-containing homebrews (*anggur panganguran*, or “unemployment wine”). The installation came out of winemaking workshops in which the collective taught safe methods of home fermentation and methods of making affordable drinks with local fruit and generated discussions about the culture of alcohol in Muslim-majority Indonesia.

### **INTEGRATING REPAIR: KLUDGING, NGOPREK, GAMBIARRA**

Workshops can naturally facilitate conversations about technology and its effects on society. For Daniel Llermaly, a Chilean musician and audio engineer who has been giving workshops under the moniker Oficina de Sonido since 2007, opening the black box reveals both the good and bad of technological systems:

Everyone uses technology a lot, but nobody knows where it comes from and how the design process works. Now we have everybody wanting to learn to program and build electronics, which is good. But it's much more important to learn other things, like how technological systems are organized and the power structure [around them]. . . . Telephones don't just appear in your hand by a work of magic. On the other hand, we are all very angry when we learn about the environmental contamination of mining [for the materials to make phones]. How can we understand the relationship between our phones and that contamination?<sup>5</sup>

Organizers often stress the need to rethink the endless cycle of development and acquisition of new technologies and to develop more sustainable approaches to electronics, emphasizing reuse and repair. How can we use the materials we have at hand and e-waste that might be considered useless scrap? How do we shift the ethos of “makerspaces” from “make more” to “make do”? The skills of “making do” and “making fit” are not simply pragmatic; they can be seen more broadly as modeling a form of creativity that does not insist on unique, exceptionally new, never-before-existing creations. Art and technology are grounded in the basic affordances and techniques of daily living as people respond to technological displacement with the improvisational tinkering, kludging, and jerry-rigging basic to socioeconomic survival.

The very idea of “hacking” can represent totally different modes of agency and access in the “emergent markets” of the Global South. Media scholar Lilly Nguyen's 2016 essay on the circulation of iPhones in Vietnam, for instance, shows that while the idea of hacking in the North is often seen as a transgressive strategy for breaking out of

corporate control, in emerging Asian economies it is seen more as a mode for gaining technical fluency in a global technoculture through intimate hands-on redesigns of its basic materials.<sup>6</sup> Given that repair is the basic starting point of innovation in circuit bending, a regional lack of access to the latest technologies can be counterbalanced by the ready availability of junk components. This approach to technology reflects how handmade electronics can embrace what Steven J. Jackson calls “broken world thinking” that reveals “what happens when we take erosion, breakdown, and decay, rather than novelty, growth, and progress, as our starting points” in thinking through technology.<sup>7</sup>

Peruvian artist Gabriel Castillo Agüero, for example, who grew up around markets full of reused and repaired electronics, describes his perspective on technology as less reliant on expertise and control than on an exploratory fascination with electronic sound and light.<sup>8</sup> In collectives such as Aloardi (Castillo Agüero, Christian Galarreta, and Janneke van der Putten), he uses inductors to induce noise and distortion into signals generated by modified musical greeting cards, builds his own electromagnetic microphones, and uses a discarded slide projector for interactive audiovisual performances (with Gisella López in Proyecto IRI).

Many handmade electronic instrument builders embrace the local lack of resources as aspects of content in their broader experiments. Javanese instrument builder Lintang Raditty created his Acak Baur (Chaos Box) to integrate the fluctuations of his rural power grid in Sewon Bantul, on the edge of Yogyakarta (Figure 36.3). The noisiness

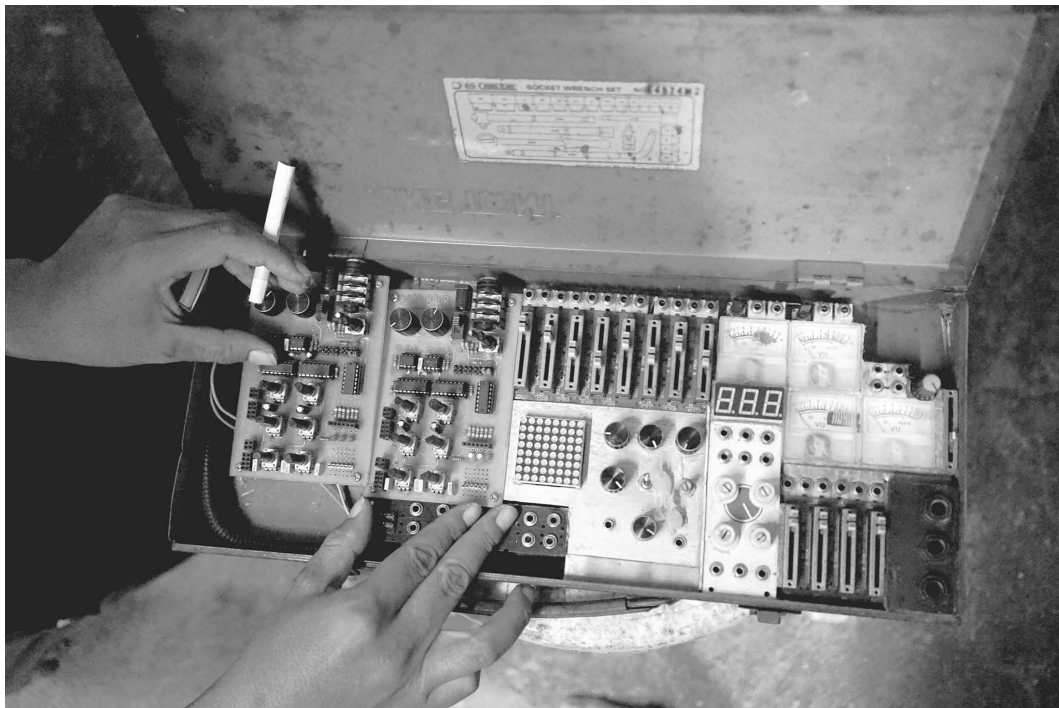


Figure 36.3 Lintang Raditty shows the chaotic functions of his Acak Baur module.

and unpredictability of the instrument work within an ecology of technological change that, he notes, is

part of our lives in Indonesia. We live with unstable electricity. If you're working with your instrument in the midday or at night, sometimes it's very different. I've tested my hardware before in the midday and at night, and it was very different. When I use it at night, we get a very smooth humming, because here at night the voltage drops, because everyone is using electricity at the same time.<sup>9</sup>

Although this instability creates enormous problems, Raditya integrated its infrastructural flux into the design of his circuit; in Australia, however, he found he had to relearn how to use the instrument because the energy supply was too smooth. These improvisations reflect the Javanese sensibility of *ngoprek*, which Raditya describes as a logic of reusing whatever is available and just “dealing with what’s around us.” Even as the Internet has radically opened up the availability of information and cheap materials for electronic instrument building, the ethos of *ngoprek* continues to guide Indonesian hardware hackers. “These days,” Raditya says, “it’s easier to get parts in Indonesia to make whatever we want. We don’t *have* to cannibalize, but we *like* to dig around in old technology and renew things.”<sup>10</sup>

Argentinian artist and musician Jorge Crowe also chooses to work with unstable and unreliable media. For his installation *Modo Submarino*, Crowe records electromagnetic signals on a prepared cassette that has been unspooled, cut, eroded, and covered in dust. He conceives of the work as a dialogue between the artist and an unpredictable environment of electromagnetic sound:

I like to think of it as machine/human communication. I ask, the machine answers and creates new questions. . . . There [wasn’t] an intention to degrade [the cassette] in the first place. But I do like to create a field where unexpected things may happen. [*Modo Submarino*] had a coil that could make “visible” the electromagnetic field of our cellphones. When the emissions reached a certain threshold, the tape started recording, running and playing that sound. But the coil also picked the EM field of the artwork and it sounded like a strange sort of breathing. I love when these unexpected things happen.<sup>11</sup>

Similar concepts of improvised and experimental remakings of technologies are expressed by other groups, such as the Brazilian collective Gambiologia, founded in 2008 by Fred Paulino, Lucas Mafra, and Paulo Henrique “Ganso” Pessoa. Gambiologia can be seen as a reinvention of the Brazilian folk tradition of kludging (*gambiarra*). The name loosely translates as “the science of *gambiarra*,” a concept in the spirit of *jetinho brasileiro*, the Brazilian way of finding creative solutions with limited resources and figuring out “life hacks” with a sense of mischief (potentially reclaiming negative connotations to the term, such as having little regard for the law). In pieces such as the playful *Gambiociclo* (Gambicycle, a “multimedia vehicle equipped for the realization of electronic graffiti and other audiovisual interventions into public space”), the collective uses clever and chaotic assemblages of discarded objects to question the presumption of technological obsolescence (Figure 36.4).<sup>12</sup>





Figure 36.4 Gambiologia, Gambiociclo.

## BENDING THE CIRCUITRY OF PARTICIPATION

New communities may be generated by those who don't fit in elsewhere, scrappy leftovers who cobble themselves together into new assemblages. Sometimes groups are formed in response to exclusionary configurations of music and tech scenes that produce uneven contexts of access (consider, for example, how the very names of online sound technology communities such as Gearslutz and MuffWiggler inhibit full participation and lead directly to harassment of female-identified members). Whether unconsciously or not, latent male homosociality can essentially create a social black box, concealing technological skills and knowledge of electronic sound-making from others. Some collectives address this with workshops specifically earmarked for groups who may not otherwise feel encouraged to experiment with electronics.

S1 Synth Library was founded by Felisha Ledesma and Alissa DeRubeis in Portland, Oregon, as a learning/work space in S1, a non-profit, artist-run gallery that includes performance, sound installations, visual galleries, and sound production classes. Since 2016, S1 has run volunteer-led workshops for learning about electronic music, as well as providing open shared access to gear, knowledge, and skills across the Portland sound community. The Synth Library was built with donated equipment solicited by DeRubeis from over 400 synth manufacturers, including 4MS, where she has worked as the communications and outreach director since 2014:

I was going to NAMM and Moogfest and Superbooth and I talked to a lot of synth manufacturers and was telling them that I wanted to do something to promote

more female participation, because frankly, I feel constantly surrounded by men and I don't like that. And everyone said, "We don't know why it's this way! We don't want it to be this way! We would love to give you synthesizers!" I wonder a lot about how it has ended up this way, but I'm not exactly sure myself, except that synthesizers exist in the world like everything else, and so they are also subject to the privilege of white men being able to access technology . . . [but] it gets worse with modular synths because they are expensive and shrouded in mystery.<sup>13</sup>

S1 began doing electronic music workshops in 2014, partly centered around the DJ collective Women's Beat League, founded by Ledesma, Daniela Serna, and Alyssa Beers as a space for female and non-binary people to learn DJing and sound production. DeRubeis added the Synth Library in 2016, offering classes in synthesis, patching, soldering, and kit building (Figure 36.5). The Synth Library holds open hours daily with facilitators available to answer questions. Addressing socioeconomic and physical obstacles to access, the organization offers a sliding scale for membership fees and accommodations for vision- and motor-impaired participants. In addition to teaching workshops for women at Moogfest and Superbooth, DeRubeis also collaborated with Czech artists Mary C and the Pink Noise Collective to open a sister library in Prague in 2018.<sup>14</sup>

Creating accessible spaces and recognizing women's contributions to sound technology has been a resonant theme in the rise of handmade electronic music communities around the world. Growing up in Belo Horizonte, Brazil, Vanessa De Michelis



Figure 36.5 S1 Synth Library workshop.

was initially excited by the possibilities of DIY collective organization through her involvement in punk scenes; the only problem was that she was interested in noise and didn't want to make punk music. Eventually, she explains, a variety of musicians joined together because they didn't play music in traditional ways, didn't fit genre expectations, or were female, lesbian, or queer.<sup>15</sup> After helping form the Azucrina collective, De Michelis grew critical of the noise community, which she saw as perpetuating the stereotypical link between technology and masculinity and emphasizing loudness and harshness in a way that reduced sound to a brutalist, implicitly masculine, aesthetic. De Michelis subverts expectations about noise artists and their work through her presentation as a non-binary person and in sonic choices that stress quieter sounds. As musicologist Tânia Mello Neiva notes, since De Michelis “does not fit into the normative standards of sexuality and gender identity, the subtle and delicate sonorities associated with the normative feminine are corrupted and questioned” by putting this work in the masculinized context of noise.<sup>16</sup>

De Michelis links her sound work to other forms of activism and community building, tailoring handmade audio workshops to females, lesbian women, LGBT communities, and youth from poor neighborhoods. In 2013, harking back to her days doing sound for punk venues, she taught a course in concert sound and stage assembly for women, noting that one of the barriers to entry for women in independent music was a lack of technical familiarity with performance. Constanza Piña, a Chilean musician who performs as Corazón de Robota with homemade and recycled circuits, connects the gendering of sound production to a social bias against women's work in general:

Latin America, as the rest of the world, is quite *machista*. With my work I develop another idea of technology. Technology can be knitting, sewing, programming, cooking; the first manifestation of technology is fire, therefore, I avoid establishing hierarchies between technologies or diminishing people who work in technical labour. It is true. Most of the time I arrive to places where only men work. But my work is my activism, I am a woman working with technologies, teaching other women to work with electronics, to revalorize techniques, manual and craft practices, traditionally made by women. To me, there is no such thing as gender anymore. The word “robot” comes from the Czech word “robot”, which means “forced labour” or the tedious work that the “man” doesn't want to do. For me, Corazón de Robota means tedious work made with love.<sup>17</sup>

## ONGOING CHALLENGES

Today, makers of handmade electronic music are facing a number of systemic challenges from fast-changing social and economic circumstances. In many Western cities, the electronics districts and junk shops that are still ubiquitous in many Latin American and Asian cities have largely disappeared. The United States, the world's largest producer of e-waste, ships most of it to other countries, moving reusable parts out of artists' reach while reducing the visibility of its environmental impact. Once legendary

for its electronics parts stores, New York City's Canal Street is now filled with knockoff purses and souvenirs; Radio Shack filed for bankruptcy and closed its retail stores in 2017, and shopping for electronic components has, for most Americans, moved online. Companies such as Adafruit, SparkFun, and Maker Shed (the online shopping division of *Make* magazine) sell pre-packaged kits that have begun to turn DIY electronics into a cottage industry of its own. The boom in modular synthesis is now represented by hundreds of small manufacturers introducing new modules for Eurorack systems on a weekly basis.

Meanwhile, many artist collectives are under threat in major cities, as rising rents make it difficult to maintain spaces dedicated to experimental arts safely and responsibly. The 2016 fire that killed 36 people at the Ghost Ship warehouse and live-work space in Oakland brutally highlighted the problem. In the weeks after the disaster, city fire inspectors shut down similar quasi-legal spaces around the country, and organizers canceled shows and scrambled to get their spaces up to code.<sup>18</sup> All-ages collective spaces are crucial, argued Ghost Ship resident Max Ohr, to allow for sound-making “on the fringes of music. [This] wasn't the kind of music that would make a lot of money for a bar. It was true self expression—people playing modular hardware, playing synthesizers, and really crafting it all themselves.”<sup>19</sup>

In the United States, some collectives have begun reaching out to their local governments, explaining their value and creating new channels for developing public arts.<sup>20</sup> But this process can result in fundamental shifts in organizational structures and priorities, transforming loosely improvised groups into non-profit organizations that can receive grants and foundation support or into aspirationally self-sustaining businesses. The Santa Fe-based Meow Wolf has, since its founding in 2008, morphed from an art collective to a B Corporation (a classification that “balances purpose and profit”) that bills itself as “an immersive experiences company,” with branches in Denver and Las Vegas.<sup>21</sup> It currently employs over 400 artist-workers, some of whom filed suit in 2019, alleging unfair labor practices and gender discrimination.<sup>22</sup>

The changeable and ambiguous nature of organizations established to share technological access and information sometimes confuses the search for new social and cultural forms with more market-driven aspirations. Even the most experimental rationales for circuit bending can be folded into the rhetoric of “makerspaces,” and the term “hack” can become lost in the mundane consumerist logic of “life hacks.” In her work on hackathons and other makerspace events in India, Lilly Irani argues that these improvisational spaces can become a programmatic way for emergent middle classes “to remake culture by drawing legitimacy from the global prestige of technology industry work practices.”<sup>23</sup> As Lauren Flood points out in her ethnography of makerspaces and electronic music hardware hacking in New York and Berlin, the “Maker Movement”

purports to revolutionize creativity and the means of production by sharing knowledge about DIY projects . . . [merging] the sense of electronics hobbyism and the idea of being an amateur inventor with the fast-paced business savvy of twenty-first-century technology start-up companies. As a result, it embodies numerous tensions between DIY as an *alternative* to or an *escape* from commercialism with the call to profit-driven entrepreneurship.<sup>24</sup>

Even events as low to the ground as circuit-bending workshops are not immune to these effects. While makerspaces can provide one-off initial exposures to electronics, they are often absorbed into a STEAM (science, technology, engineering, arts, and mathematics) curriculum that provides few opportunities to build a long-term educational structure.

In validating the social and educational productivity of DIY entrepreneurialism, hacking workshops also regularly downplay aesthetics in favor of the techy start-up gleam associated with exposing beginners to electronic circuitry. Artist and engineer Andreas Siagian lamented that after years of conducting introductory circuit-building workshops: “Even though I’m always happy to see people’s responses when they join the workshop and see the results, I get tired of hearing the same sounds over and over again . . . it’s like reinventing the wheel every time.”<sup>25</sup>

Collectives also face the functional drawbacks of allocating funding and credit among members, as when debates about who should be recognized as the primary author of an artwork split the House of Natural Fiber in Yogyakarta, with several members departing and reforming as Lifepatch.<sup>26</sup> Further, the recognition of global collectives, while highly productive (i.e., the 2019 selection of Jakarta-based collective *ruangrupa* as the first Asian curators of the prestigious Documenta contemporary art festival in Kassel, Germany) can also result in a politically reductive reception in which artists from the Global South are viewed primarily by the international art world through the lens of regional culture. The very aspect that makes the do-it-together model so appealing, then—its ideological refusal to highlight any particular individual or art product—also generates substantial interpersonal, socioeconomic, and transcultural challenges.

Despite these complexities, many artists remain committed to handmade electronic music and to collaborative forms of organizing. Maintaining spaces for performance and exchange is essential for these communities as they bring techniques from the world of technological experimentation into the sites of new social movements. When black boxes are opened and people peer in . . . when people gather to change sound and listen to sound change together . . . when electronic circuits flow into open environments that combine learning with mystery . . . when the vitality of noise overwhelms, rather than reinforces, the norms of social identity . . . when cycles of technological creativity feed back into process instead of hardening into product . . . when a collective holds open a space in a modern city that provides respite from the hegemony of private property . . . then we can hear it again—the sound of the circuit, the sound that communities make when they embody the spirit of hacking, breaking it down and starting again from scratch, to bring people into new worlds of sonic and social possibility.

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