Ugly Construction booklet for Reactor Halls E12: Ugly Weekender
Dirty Electronics
Primary, Nottingham
13/14 February 2015

EDITED
John Richards 2015

COVER ILLUSTRATION
Natalie Kay-Thatcher
ugly construction no. 1

BOOKLET LAYOUT & ARTWORK
John Richards

This event and publication has been support by Arts Council England.
DIRTY ELECTRONICS UGLY WEEKENDER

A 24-hour retreat exploring DIY electronics, sound and design

"The most difficult challenges for designers of electronic objects now lie not in technical and semiotic functionality, where optimal levels of performance are already attainable, but in the realms of metaphysics, poetry, and aesthetics …" Anthony Dunne, Hertzian Tales

Microprocessors and electronic circuits have become part of the very fabric of everyday life, omnipresent. Yet our relationship and understanding of 'what is often keeping us a live' becomes more intangible. Thousands of components populate devices in the palm of our hands or machines we have become reliant upon, and to most, these esoteric components exist unseen beneath a surface, silent and anonymous. Circuits of great complexity carry electrons to enact seeming miracles. And in these designs there is beauty in both form and function.

Dirty Electronics Ugly Weekender will take a macroscopic approach towards electronic circuits, playing-out the forms and exploring shapes and patterns latent in their design, and investigating how these circuits could lend themselves to a performance. A simple circuit based on a voltage-controlled amplifier (VCA) combined with a microprocessor will be used as a starting point for the work. A devised new performance will emerge through a 'sleepless' night and be performed the following day. The 24-hour retreat with invited artists/participants will be used as a catalyst to create a dynamic approach to live electronic sound and musical composition that explores a fluid methodology for working across different disciplines. A special menu and banquet based on the ugly weekender theme will also be prepared for the participants. Central to the Ugly Weekender will be the publication of a booklet containing essays, illustrations, sketches, diagrams, and muses by participating artists and guest writer.

The title Ugly Weekender derives from a DIY radio transmitter project that appeared in an article by Roger Hayward and Wes Hayward published in QST, a magazine for amateur radio enthusiasts, August 1981. Wes Hayward also used the term ugly construction to describe a method for creating DIY circuit boards that also includes Manhattan style and dead bugging techniques.

John Richards 2015
**JENNIFER LUCY ALLAN**

"The possibility of all similes, of all the imagery of our language, rests on the logic of representation." (Wittgenstein, Tractatus Logico-Philosophicus)

Hack. verb (TO CUT)
1. to cut into pieces in a rough and violent way, often without aiming exactly:
Three villagers were hacked to death in a savage attack.
The butcher hacked off a large chunk of meat.
UK figurative: The article had been hacked about (= carelessly changed) so much that it was scarcely recognisable.
(Cambridge dictionary)

Hack. The word is a sharp, heavy axe; a sharp glottal bite, chopping the air as it is spoken, almost onomatopoeic. It comes from the Old English haccian, which means to 'cut in pieces'. Hack not only sounds like a brutal instrument, its etymology refers to the effects of one. When we hack we are breaking apart, bodging together - we are breaking, smashing, chopping, cutting, mutilating. We fall ill with a sharp hacking cough; our information is stolen via illegal software hacks.

The word originally began to be used in the field of electronics and computers around the 1960s - Eric Raymond in his *A Brief History of Hackedom* says that it was originally used by amateur computer enthusiasts who tinkered with equipment and built their own hardware or software. From its original uses, the term then exploded and expanded to take in all manner of activities. Now, a hack day is one where groups meet to create. An instrument hacker is someone who builds. So how did we get from the destructive force of a hack, to the creative problem solving of a hacker? Is the term still fit for purpose?

The word is a pigeon hole; a signpost; a box for activities to be put in. What might we use instead? Circuit bender? This is little better, although it possesses some attractive features. Should we look for an old word to use for new purposes, to denote new relationships? Or should we make a new word, one that comes with no baggage, but no heritage either - a word younger than the history of the craft. Where is the suggestion of creation? In his piece for this publication, “Transcendental Hacking”, Jim Frize notes: “I'm often called a hacker or a circuit bender but I'm not sure I'm either of those ... Sometimes I'm hacking, sometimes I'm designing and sometimes it feels like I'm hacking one of my own designs.”

When we use these terms, circuit bending, hacking, what are we losing in translation? Lucy Stevens notes how environmental noise can stop birds from mating, from procreating. Maybe there's a parallel here. John Richards has often spoken of the importance of doing things together, en masse, as a group, in a place, a location. Is the noise of our digital interactions getting in the way of our ability to sit down and make sound together?

Frize’s considerations are not purely technical, but aesthetic and creative too. Natalie Kay-Thatcher’s illustration for this booklet resembles a collection of fragmented letters, from which we might assemble the language we need. What new verb might we pull from its concrete
poetry of half built words and tangled wires? Can we take a language lesson from somewhere else? The concrete poets of the 1960s and 1970s, writers like bpNichol, changed the way words might be used, involving shapes as well as their meaning. Perhaps we can start looking at the forms in our circuits for what they could mean, as well as for what they could do? Can we find a train of thought in the machine-like score of John Richards’ 8-bit? Is the ugliest thing about this Ugly Weekender the clumsiness of the language with which we’re forced to describe it?

Famously, Steve Jobs sent new devices back to engineers with requests that the motherboards be made more pleasing to the eye. Perhaps we should be looking towards a simplification - the real life macro view of circuits, personified in stretchy blue leotards in Moon-Age’s images, where bright red and white tubes loop between open mouths.

Strewn about the room: black wires; red wires; soldering irons; resistors; batteries; coloured plastic; voltage-controlled amplifiers; clips, plugs and sprung claws. Carefully apply drops of dripping solder. Secure connections. Create a conduit for the current and a channel for a sound.
8-BIT (JR14)
for large group and stone knocking

performers split into three groups
(each part has multiple performers)

1 = strike/on 0 = rest/off

repeat sections - explore different combinations -
use tacit (e.g. part 1 + part 2 - part 3 tacit)

tempo = moderate

parts to be read in columns

<table>
<thead>
<tr>
<th>part 1</th>
<th>part 2</th>
<th>part 3</th>
<th>part 1</th>
<th>part 2</th>
<th>part 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000110</td>
<td>11110101</td>
<td>01110100</td>
<td>01110001</td>
<td>10101111</td>
<td>11001111</td>
</tr>
<tr>
<td>00000110</td>
<td>11110101</td>
<td>01110100</td>
<td>00011000</td>
<td>10011011</td>
<td>01010010</td>
</tr>
<tr>
<td>00000110</td>
<td>11110101</td>
<td>01110100</td>
<td>00101111</td>
<td>00010100</td>
<td>00010011</td>
</tr>
<tr>
<td>11110101</td>
<td>01110100</td>
<td>11110101</td>
<td>11101000</td>
<td>11110010</td>
<td>10001111</td>
</tr>
<tr>
<td>11110101</td>
<td>01110100</td>
<td>11110101</td>
<td>00100100</td>
<td>01001110</td>
<td>11111001</td>
</tr>
<tr>
<td>11110101</td>
<td>01110100</td>
<td>11110101</td>
<td>10011011</td>
<td>00110011</td>
<td>00001000</td>
</tr>
<tr>
<td>01110100</td>
<td>00000110</td>
<td>00000110</td>
<td>11001111</td>
<td>10001100</td>
<td>10111001</td>
</tr>
<tr>
<td>01110100</td>
<td>00000110</td>
<td>00000110</td>
<td>00111001</td>
<td>01001101</td>
<td>00010101</td>
</tr>
<tr>
<td>01110100</td>
<td>00000110</td>
<td>00000110</td>
<td>01011000</td>
<td>01011000</td>
<td>00110001</td>
</tr>
<tr>
<td>01110100</td>
<td>00000110</td>
<td>00000110</td>
<td>11101100</td>
<td>01101110</td>
<td>00101110</td>
</tr>
<tr>
<td>01110100</td>
<td>00000110</td>
<td>00000110</td>
<td>01101000</td>
<td>00010111</td>
<td>00110101</td>
</tr>
<tr>
<td>00000110</td>
<td>00000110</td>
<td>00000110</td>
<td>01110110</td>
<td>00000000</td>
<td>01101101</td>
</tr>
</tbody>
</table>

accel

on cue

11111111 11111111 11111111
CIRCUITS OF FANTASY, FICTION AND REALITY

JOHN RICHARDS

I've been thinking about the work of artist Brian Griffiths. Dick Price, on writing about Griffiths and the Neurotic Realism exhibition held at the Saatchi Gallery in the late nineties, highlights that the artists were concerned “...with fiction becoming a common starting point rather than theory”. In the case of Griffiths’ work Osaka, Taylan and Ron (1998) it is fictitious technology and futuristic machines of the imagination; and as Adrian Searle in the Guardian wrote “high-tech consoles and forbidding machines the Blue Peter way”. These ‘machines’ have no function other than to tap into our collective memory of ‘technology’ in a nostalgic way conjuring early science fiction imagery and the sort of ‘friendly robots’ akin to Nam June Paik. Of course, as a musician I’m interested in objects that make sound. Therefore the realm of mere make-believe is often discarded through the need to make things vibrate and the necessity to ‘play’ or control/uncontrol’ the instrument. But what of total optimisation? An instrument designed to be played effortlessly and efficiently, optimised to a point where, for example, it becomes just a question of breathing and sweet music wafts through the airwaves. With ‘ease’ deeper relationships do not always form. And with Griffiths’ junk sculptures there is a feeling conjuring a Wizard of Oz moment. The veil or curtain can be drawn revealing an illusion: the sculptures are not ‘technology’. With this, many of the questions and potential underlying tensions present in Griffiths’ work evaporate.

This is where Daniel Weil’s Radio in a Bag starts to ask more questions. By simply re-housing the technology, Weil completely debunks all the pre-conceptions associated with radio: the Bakelite case, crackly plummy voices, ergonomic dials and switches, and the home … The ‘radio’ and ‘bag’ coexist in some form of new relationship that the user has to learn/re-learn. History is re-written!

The work of both Peter Vogel and, more recently, Leonardo Ulian is concerned with the electronic component as raw material for sculptures as well as functioning sound circuits. Vogel’s delicate geometric wire sculptures are gallery pieces that often respond to environment, and there is a clear aesthetic that marries the behaviour of the circuits and their sculptural properties. Phil Archer in his article “Circuitry and Aesthetics” talks about how Vogel uses electronic components, not only as functioning parts, but also as a means to comment on social and cultural attitudes surrounding technology. The intricate technological mandalas of Leonardo Ulian similarly challenge our relationship with the electronic component. In Ulian’s work, the hidden esoteric nature of electronic devices are redefined, and ideas surrounding technology, such as mass production and optimisation, are replaced by hand craft, symbolism and abstraction. Ulian’s Technological Mandala 42 - Random relay, for electronic components, copper wire, amplifier, am radios, electric wire, speakers, pedal effect, and adaptors, brings together many symbols of technology - old radio, electronic components and wire, etc. - and through the construction of a ‘technological’ mandala creates a new metaphysical microcosm.

John Bowers has also been interested in the underlying potential of the electronic component as a microcosm for making sound. In his article with Vanessa Yaremchuk, “The Priority of the Component, or in Praise of Capricious Circuitry”, they ask us to:
… let components themselves be your first love. Love the multiplicity of them when you buy in bulk. Love the color codes on resistors. Love the varied shapes of capacitors. The bright colors of wire insulation. The spikiness of transistors. The sleek lines of ICs.

It is in Bower’s work *Ohm-My-God* - a large mixing bowl filled with electronic components that acts as a way of creating indeterminate voltages that in turn control sound devices - that a more ad-hoc approach to circuitry is applied. The idea of infra-instruments (instruments that are of in-between state, not fixed in form, assemblages) is very much at the root of Bower’s philosophy. And in *Ohm-My-God* it is through the electronic component that the idea of infra-instruments manifests.

This brings me to the work of Kanta Horio where the theoretical and fantastical collide. Horio’s works are as much visual as sound sculptures. There is a common theme of movement and balance that runs through many of his pieces. Works such as *Mysterious Computing 0.1b* are like giant mobiles that share some of the aesthetics of the constructivists and the sculptures of Alexander Calder. And there’s ideas of Duchamp’s assemblages in there too. Yet in Horio’s work, technology is the driving force behind his electro-acoustic-mechanical ‘happenings’. At times Horio’s work resembles a physics experiment in a classroom. Then there are the ‘magic tricks’ where electro-magnetism is used to mysteriously move found objects that as a consequence vibrate and resonate: fantasy, fiction and reality in one.

an aside …

There seems an anti-technology seam running through Leonardo Ulian’s work, much like that of Nam June Paik’s. Paik’s *Candle-TV*, where a TV’s screen is replaced with a lit candle, has parallels with Ulian’s *Now and forever* where a mini LCD screen with a video of a flame is put inside an old gas lantern. Wulf Herzogenrath in “The anti-technological technology of Nam June Paik’s Robots” highlights Paik’s critique of technology. But it is not just the case of Paik being anti-technology. It is his use of universal symbols such as a lit candle placed ‘inside’ the TV that creates such a conflicting set of ideals forcing us to re-evaluate our relationship with not only the television, but also technology in general. Paik’s work could be considered at the forefront of engagement with the concept of the post-optimal electronic object and the metaphysics of everyday technological devices.
ROAR OF FREQUENCIES

JENNIFER LUCY ALLAN

How to make the sound?

[the /SAUND/]

To translate the thought into
A roar of frequencies

made in a studio, by men and women, crouched over circuit boards,
imagine:

a 40-storey tall beast from the deep,

Giant wooden crate,
dragged across a polished floor.

Dry ice on a metal vent;
rocks crunching;
actual whale bellows.

Fix A to B and B to C       [didn't work]

Then C to A and B to D, and

a RRAAAAAAHH, and then a

WWWOOO-WOOMPH!
BECOMING POST-OPTIMAL

PHILLIP HENDERSON

At dusk I remembered accidentally transcending my dimensions at dawn.

It was sunrise and I was driving my car on a southbound motorway when I overtook a lorry. It was a massive lorry hauling a massive open-ended concrete hollow tube. The tube was long and several metres in diameter. It was concrete and had great mass. There was no special event. I overtook the lorry very slowly.

There was nothing unusual about this, except now I felt an understanding of the tube. The world outside me and the tube became a blur and we were now together like animals of the same species passing on a well-trodden track. I experienced nothing except the tube and me in motion and became aware that we acquired a kind of weightlessness, the tube moved effortlessly.

The tube disturbed nothing. The rising sun shone light beams through it providing energy to guide its trajectory away from the planet. I wondered if the rising sun would lift the tube away from me and return it at dusk. As it began to depart it silently explained to me that it was a plane and it will be a sphere. Before I had time to form my next thought into words the tube became transparent.
ON PERFORMANCE: UGLY CONSTRUCTION

Correspondence between John Richards and Alex Moon-Age, January 2015

To Alex Moon-Age

On Code
Given that the base circuit has a digital element, some kind of code poetry or text artwork inspired by Le Monte Young’s and Jackson Mac Low’s An Anthology of Chance Operations could work. There is also Jamie Allen’s edition of code (poems) that’s interesting. The fact that you have no idea of what it may sound like is even better. It could simply just look good on the page. Below is an example. The critical part of the code is made up of tables/arrays of numbers from 0 - 255; so, {0, 255, 0, 255, 0 255} or {1, 50, 51, 101, 152, 253}. Just think patterns. Getting you to write the code would be very much in the spirit of the work and of course ‘post-optimal’. It is a little bit similar to the idea I’ve written about on delegated performance as a strategy to discover authenticity in a work; so delegated coding makes a lot of sense by asking a non-expert, novice, an Alex Moon-Age to write such stuff.

Light
I have a few performance ideas forming and how the space could be set. The back wall of the performance space is white giving us a large area to project on. I’ve been interested for a while in exploring different light sources, incandescent bulbs combined with projected light, an idea I explored in the piece Dual Light with Tim Wright back in 2009. I was thinking of developing this idea to include swinging light bulbs and automated rotating mirrors that throw light around the room - think shadows, flickering light and optical effects. I’ve worked with choreographer Saburo
Teshigawra who would spend hours on lighting. For example, his work Glass Fragments of Time consists of a stage full of smashed glass and plays with the idea of light and reflections. More specifically, he has worked with incandescent bulbs in the pieces Obsession and Miroku ... I think there could be more scope for freakish shadows like the 1920s film The Cabinet of Doctor Caligari.

In terms of sound, I've also amplified fluorescent tube starter mechanisms that are like relays. They make a clicking sound. This sound seems particularly effective when working with such light sources. It's the idea and sound of the switch that's deeply embedded in our subconscious. As a contrast, I am thinking of transcribing and scoring some of these automated clicks for performers knocking stones together, stones being the ultimate primordial technology! This takes the notion of upgrading in the digital realm and turns it on its head to the post-optimal downgrade. I might also try and see if I can use some binary code de-computationally as a score for knocking stones (1 = hit, 0 = silence).

Performance
Based on the circuit and ferrite rings, a large rubber ring suspended from the ceiling. Dead-bugging. Some kind of piece where the performers play with their legs pointing up, dead bug style, possibly tied in wire. I've got a load of old dining knives. We could extend some circuits on the floor in the performance space using these knives, much like Daniel Weil's Clock (1983) ... macro-circuits. In fact, I would like to stretch wires across the space (part of circuit): the space is explored through the circuit. This might involve quite a bit of ladder work and me over-coming vertigo! Then there is blood, well fake blood - always good for carrying electricity.

Moon-Age to JR

other ideas and sketches

would it be possible to have people lying down - light bulbs coming out of mouths and turning on and off in accordance with the sound..\human bodies to literally represent a circuit board... covered in material - movement but you cannot see the underlying structure.

images...
connecting limbs, extending, popping balloons, climbing up ladders- levels -- I liked what you mentioned about the dead bugging imitation and banging stones, electronic object imbedded in bodies -- armpits, on stomachs, passing signals/messages across room in the form of rolling balls, that light up in the dark?

could take some kind of inspiration from this...
"The simultaneous development of both kinds of electricity is illustrated by the following experiment. Two persons stand on stools with glass legs, and one of them strikes the other with a catskin. Both of them are now found to be electrified, the striker positively, and the person struck negatively, and from both of them sparks may be drawn by presenting the knuckle."
Light bulbs in mouth switching on and off in sync with sound, conduction.

Connecting, squeezing, sending messages.

Lying on bells and sending a 'ha' or some stomach dancing sound.

Movement undercover. The underlying structures.

Rolling balls of light.

Connections. Reacting to sound w. the body.
CIRCUIT IN BLUE

In this image Hadas Hinkis and I have created our interpretation of a circuit board - we both have a strong interest in electronic music. However, we have a naive understanding of the workings of circuitry, the guts of machinery. We appreciate their intricate aesthetic beauty, the geometric patterns, balls and lines and the results of experimenting with sound sculpting - our endeavours with electronic music involve many beautiful accidents. This is our visual interpretation/imitation - we are transistors sending electronic currents to each other. In this photo we are also inspired by Kandinsky’s colour theory and the relationship between body and costume - extensions, play, the grotesque.

Alexandra Moon-Age

overleaf
left: Circuit in Blue no. 13
Alexandra Moon-Age and Hadas Hinkis

right top: Circuit in Blue no. 5
Alexandra Moon-Age and Hadas Hinkis

right bottom: Circuit in Blue no. 2
Alexandra Moon-Age and Hadas Hinkis

photography: Christoph Neumann
TRANSCENDENTAL HACKING

JIM FRIZE

I'm often called a hacker or a circuit bender but I'm not sure I'm either of those. Although I've done work that could be described as hacking or circuit bending, such as making a delay by hacking together two tape recorders or re-housing a computer keyboard to make a custom controller. I also do work where I create original circuits such as the JS-1 Dub Synth or White Label Synth. Sometimes I'm hacking, sometimes I'm designing and sometimes it feels like I'm hacking one of my own designs. Should I consider myself an electronic engineer or a circuit designer? I don't have any formal training as an electronic engineer, I'm approaching my work from the perspective of an artist or musician and I have different concerns when it comes to goals, outcomes and the design process in general. I don't work in the same way as an electronic engineer, so I don't feel I can describe myself as one. A lot of the time I'm dealing with ill-defined problems, 'sticky' questions that don't have straightforward answers. To me it's not solely a technical challenge, but equally an artistic and aesthetic one. Often when I'm prototyping or designing a circuit I have no idea what the result will be. It's simply an exploration into the possibilities. To me this part of the process is more akin to jamming or improvising as a musician rather than engineering or designing. Other times I have a very clear idea of how I'm going to proceed with a design, and I may even have a specific circuit or topology in mind. At times I feel stuck between two worlds, the worlds of technology and art. I'm making devices that require a certain amount of artistry to create. In fact the circuit layout used to print a circuit board is known as the PCB artwork. However, some may regard these artefacts as solely tools or instruments used for the creation of art and not art in themselves. I was recently asked: "Is it enough to just create these devices? Or do you intend to compose works and performances for them?". I think the implication here was that the proof is in the pudding whether or not I regard my devices as artworks in their own right. An instrument without a piece to play is like a performance without an audience, an unfulfilled destiny. And I agree with this; ultimately, to some extent, instruments are meant to be played and performances are supposed to be seen or heard. I need to know where I fit into the landscape that exists between technology and art. There seems to be a lot of overlap between composing, designing and engineering and, for me at least, the distinction between these practices is not always clear.

In 2006, I met John Richards and in one of my undergraduate courses he introduced me to something called the no-input mixer. This involved creating a feedback loop with a standard audio mixing desk. The controls for EQ and gain ceased to perform their 'regular' functions and became the controls to a somewhat unwieldy feedback oscillator. During the course we tried the same technique with a variety of audio devices. Students brought in guitar effects like phasors, delays, distortion units and wah-wah pedals. Up until this point, I had spent most of my time playing stringed instruments and percussion or grappling with music production software. I saw instruments and musical equipment as something to be protected and only to be used as directed by the manufactures instructions. Wanton equipment misuse was totally alien to me, but I found many things about the no-input mixer appealing. Aside from the anti-authoritarian two fingers to the instructional manual, the instrumentalist in me liked being able to work live and hands-on, not having to edit sequences in a Digital Audio Workstation or waiting around for a file to render or process. The student in me also liked instruments that didn't come at an
eye-watering high price. The ideas and concepts behind no-input mixer felt accessible. There was no need to read the equipment manual, no big fear of breaking things or doing it wrong. This experience, and other experiences I had as a degree student made me re-evaluate some preconceptions I had about music. It was like the floodgates had opened. All of a sudden any object could be a musical instrument, and almost any sound could be music. It took me a long time to comprehend some of these ideas and the consequences they have; indeed I'm still processing it all now. One of the key concepts that sprang out of these realisations is the idea of composing inside electronics. This has now become an integral part of my work and practice. In 1973 a group of experimental electronic musicians formed a loose collective known as Composers Inside Electronics. This group centred around the pioneering work of David Tudor. One of the things I really like about this group is how succinct their name is. The most defining characteristic of their work is the belief that when designing and constructing electronics they are engaging in an act of musical composition. This straightforward assertion not only has ramifications for what it means to be a composer but also what it means to be a circuit designer. For some the role of composition is centred around writing notes on a stave, but in a world of electronic instruments, in a world with virtually limitless timbres and adjustable parameters, notation and composition becomes something else. Within my own work, composition has become a mixture of producing electronics schematics, code for embedded micro-controllers and visual scores.

Some of the words used to describe the various related practices within my field are confusing. Terms like DIY, prepared, hacked, bent, modified and augmented are often used interchangeably. Most of these terms have historic and stylistic connotations but they also have some explicit or implied technical differences. Rather than getting bogged down in semantics, I'm going to pick on the word hack and talk a little about what I think it means, or at least what I want it to mean when I use it. To hack you need a pre-existing object, system or construct and you need to modify it. So the next question would be: "What is the difference between a hack and a modification?". I believe that in the broader context of the word there is no difference between the two, however hacking does imply a few things and for my purposes I won't be using the word hack in this broader context. Hacking often occurs without specialist knowledge: it is entirely possible to modify the function of something without knowing how it works or how it is constructed. It is also implied that the hack is a modification that was not explicitly planned for during the initial design and creation of the object. Lastly, the hack must not be a modification that is a generally accepted part of an object's common usage. That last point rules out peeling a banana as an amazing hack for avoiding its unpalatable waxy skin. It also throws up interesting points about the legitimacy of hacks that are well-known and commonplace. So by my definition, the more informed you are, and the more premeditated you become, the less of a hacker you are. At this stage you begin to engage in something else. Through practice you have transcended hacking and arrived at a new discipline, something I have coined trans-hacking.

And it's not just me that's working in this way, I think this is phenomenon. With the advent of Arduino, Raspberry Pi, circuit bending and freely shared information on the web, an increasing number of artists and amateurs are engaging with electronics on their own terms. Hacker spaces that facilitate this practice are spinning out projects that have become products and businesses - no longer the work of "hackers" but that of a consummate professionals, trans-hackers.
THE CIRCUIT & CODE: UGLY CONSTRUCTION

JOHN RICHARDS

As Dirty Electronics I’ve been primarily concerned with working with analogue circuits. The components themselves act as materials as well as having referential qualities. The ‘old’ technology also generates some distance from the here and now and gives rise to a greater sense of objectivity. Some of components and techniques used in circuit design are often chosen purely for visual aesthetics. Then there’s the handwork and crafting techniques. But for the Ugly Construction I wanted to introduce a digital element simply to highlight the esoteric nature of embedded electronics and set-up a conceptual framework for hybridity. Code is created using various processes and at times leans towards metaphysics and poetry; whereas tables and arrays of numbers are used to create patterns and ‘rhythms’ both visually and sonically.

In the Ugly Construction, a microprocessor provides control information - through the use of pulse width modulation (PWM) and filtering techniques - for a voltage-controlled amplifier (VCA). Limitations appeal to me. I’ve got a fascination with haikus, aphorisms, and epigrams, and the world’s simplest oscillator and all that. It’s a kind of electronics minimalism. … But for ease of programming, it’s the ATMEGA 328P microprocessor (found in all those Arduinos). Life is short! The rest of the circuit consists of some vintage component resistors and capacitors, connector pins and sockets, a passive filter using coils made from copper wire and ferrite rings and beads, and copper clad board. Dead bugging techniques, where an IC is glued on its back with its pins (feet) in the air resembling a dead bug, and CNC routed circuit boards are also explored.

I keep being drawn to the amplifier, not as a means for making things louder, but for generating sound. The common operational amplifier (op amp) features in many Dirty Electronics’ designs and is used to create feedback, filters, oscillators, and noise generators, etc. In particular, the ideas of feedback networks (sonically and symbolically), modularity, interconnectivity and resulting complex systems are often at the fore.

Even though there are ‘fixed’ programmed patterns in the Ugly Construction, these patterns become voltages that can be manipulated in the analogue domain; so the code has the potential to produce many different results. Using feedback leads to unpredictable behaviours in terms of the sound. This is the beauty of it. Andy Keep’s writing on feedback is particularly interesting, especially the notion of feedback as a ‘behavior’ and how different sounds are created through signals that bifurcate. There can be very fine tipping points in a feedback circuit: a slight increase in gain can produce a radically different sound. The response of the circuit is very much non-linear. In the Ugly Construction circuit it is possible to scale the voltages and gain of the VCA, and it is the threshold between two states that often produces the most interesting results and behaviours.

Sound = noisy textures with an intense ‘behaviour’ and constant momentum, on the edge of control, angular, bold and often anarchic. Subjectively may be considered ugly! The circuits are what they are: mono, battery powered, generative feedback networks. There is no attempt at ‘humanising’ the rhythms, filtering out ‘harsh’ frequencies or adding additional over-dubs.
Ugly Construction Kit details: www.dirtyelectronics.org/download.html
CODE 1, 2 (JR15)

{1};
{1, 11};
{1, 11, 11};
{1};
{1, 11};
{1, 11, 11};
{1};
{1, 11};
{1, 11, 11};

{222, 22, 222, 22, 222, 22, 222};
{22, 222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{222, 22, 222, 22, 222, 22, 222};
{22, 222, 22, 222, 22, 222, 22, 222};
{22, 222, 22, 222, 22, 222, 22, 222};
{22, 222, 22, 222, 22, 222, 22, 222};
{22, 222, 22, 222, 22, 222, 22, 222};
INFORMATION, THY NEMESIS IS REVERIE
DE-COMPUTING THE FUTURE THROUGH DESIGN

JOHN FASS

De-computation is an approach to using computational thinking. It’s about de-mystifying, de-constructing, de-composing, de-coding, de-programming machines, minds, space, and time. It’s about observing people, places and systems and applying a design method to create new forms.

There is growing anxiety that computers are taking over the world. Sex, food, money, art, desire are all subject to increasing automation and algorithmic complexity. Some go even further, believing that artificial intelligence, the internet, smart objects, buildings and cities make for dumb humans. In a perverse role reversal - the calculating machines that were supposed to liberate us from drudgery have instead made us their automatons. We stare into mirroring screens all day, our backs to the cave entrance, lost in the kind of recursive loop machine language is so good at. The rhythm of human life has assumed the rhythm of data transformation. Repetitive, recursive, relentless.

Computational thinking has increased in visibility alongside the rise of ‘big data’ and data-driven business processes. More broadly, information, and specifically computation, has come to be regarded as a central concept in biology and physics. Physical computing has put DIY digital tools into the hands of artists and designers. Ubiquitous and pervasive computing has embedded digital technology into the lived world experience of the kitchen, the bathroom, and the garden shed.

According to Google, computational thinking has four steps: decomposition, pattern recognition, abstraction, and design. This means breaking something down into manageable or meaningful components, and then remaking it in another form or making something new from it, based on some analysis of the parts. De-computation uses similar steps, but in sometimes varying order. We interpret the steps as follows:

1. De-construction
Theories, objects, datasets or systems are broken down into smaller parts. The reason for doing this is to discover the nature and number of constituent elements. Methods for de-construction include physical disassembly, text analysis, and data inspection. The process of de-construction can be profoundly revealing as hidden components come into literal and conceptual view.

2. Pattern recognition
Each part is examined and compared with others - sometimes by placing them side by side literally and visually. The relationships between separate elements often shows a discernible pattern. If a pattern is not immediately apparent, we suggest counting or measuring, or seeking criteria for measurement. Here, more traditional research can be useful - for example comparing a pattern against other data or other researchers’ findings while being wary of making spurious correlations.
3. Abstraction
Once something interesting has been found, whether a pattern in the data or an unusual method of analysis, this can be generalised in order to make some prediction or statement about the larger dataset, population, or the world at large. Here we encourage thinking of ‘abstract’ as in art - for example in terms of simplified shapes and colours; the less something resembles some specific thing in the world, the more it communicates across categories.

4. Construction
De-computation treats design and computing as verbs, both are wide-ranging practical skills and activities. The object of construction in this step may not be a physical or digital thing but a workflow, performance, or structured activity in which others make things. Design is programming in a broad sense, whether coding an app, curating an exhibition, or influencing behaviour in hospital waiting rooms.

If, as Van de Velde proposes, the world can be regarded as a kind of computer, which computes its own future, designers are able to program this computer by directing people’s attention and behaviour through designed products, processes and interventions. De-computation is a new methodology for understanding, and questioning an increasingly computer-controlled world.
DECONSTRUCTED BANQUET

Correspondence between Kimberly Bell, artisan baker Small Food Bakery, and John Richards January/February 2015

To Kimberly Bell

As I mentioned, it would be good if the menu somehow connected to the theme or spirit of the event. I have attached a brief outline. Some kind of ‘metaphysical’ or post-optimal menu could be interesting. Of course the food will need to sustain us as well! But food for thought...

Here is a picture of David Weil’s Radio in a Bag. All about de-construction, re-contextualisation, and re-appraisal of relationships with objects. I suppose it is also concerned with re-packaging and presentation to see things in a different light; so we could take one of your stalwart menus and twist things a bit, de-construct it etc. ...

Just the evening meal can be ‘experimental’ ...

Presentation ...
Soup in a bag
Toast on beans
Mug of poached egg
Skewered salad
Grated potato on cheese

Juxtapositions and incongruity ...
Nut roast with ice cream
Soup tartlet
Jam and vegetable stew
Roast peppers stuffed with oranges
Raspberry and tofu pie

To John Richards

Thanks John,

That’s very helpful. I think I understand now what you are after ...

I’m happy to do something ‘normal’ for the lunch but I’m wondering about creating a series of decorated savoury sponge cakes, maybe served with savoury ice cream (I have an ice cream machine) and a sweet soup for pudding?

Hi John,
I’ve been thinking about the evening meal, and that you want it to be quite a grand banquet with a playful element (but presumably delicious and enjoyable too). I think one way to present it
would be as a ‘deconstructed banquet’.

I would write up the menu on a black board with a list of dishes like a café specials board but then lay out all of the component parts down the centre of the table. These would be piles of vegetables and prepared fruits, dried nuts, seeds, dressings and spice mixes, flavoured oils, rice, lentils, beans, flatbread, piles of chopped herbs, lemons, limes, jugs and bowls of sauces etc. The diners will have to build their own dish according to what they presume the menu to indicate. Everything would be cooked and hot/cold as required but displayed as entirely separate components.

This type of meal is suited to either Indian or Persian cuisine (I have plenty of experience cooking both so I don’t mind), and both would allow for a really exciting vegetarian feast where the boundaries between sweet and savoury are a little blurred. I usually find this kind of food to be very inclusive, and it encourages people to try things they wouldn’t normally eat. In this context it would require lots of cooperation and experimentation. It will be interesting to see how people deal with it, and it should look really great as well served on lots of different types of plates etc.

Let me know what you think. ...

Kim

Small Food Bakery provided menus for the 24-hour artist/participant retreat for the Ugly Weekender, 13/14 February 2015
WRONG BIRD

Correspondence between Lucy Stevens and John Richards, January 2015

To John Richards

The thing I’m most interested to explore as part of this opportunity is the notion behind app technology and for me I’m particularly interested in how we use this technology to learn and navigate a space. For example, a birding app to teach identification skills which uses photos, sounds and sonograms or a GPS locative sound walk and how this can add another layer of sound to the existing soundscape of an area, as well as completely change the experience of a space by immersing the listener and taking over the auditory sense. This constant layering of sound has an impact on the way we choose to listen or what we decide to filter out depending on our relationship with a space and the effect of the environment on our behaviour. In the same way urban wildlife has to do a similar process, by adapting to the increase in noise, by singing louder and more frequently to fend off another male or attract a mate or to change their behaviour by making movements with their body and tail to communicate, as it becomes increasingly difficult for bird species to compete with anthropogenic sounds and other noise pollution ... something for me to have a think about before I meet up with you all on Fri 13!

To Lucy Stevens

Thanks for the reply. It’s made me think about using such a birdsong identification app in a ‘false’ sonic environment. A lot of the sounds generated by the Ugly Weekender circuit have birdsong-like qualities. And it has occurred to me on many occasions that these circuits often represent a soundworld that appears to represent a natural habitat; so I often envisage such circuits as environmental or ecological metaphors. What will the app make of screeching feedback and electronic pulses? The idea of false recognitions and nearest fits would seem to have a lot of mileage creatively. I could imagine a birdsong recognition app responding to the sounds we create by throwing up an image of, for example, a black grouse along with information on the bird’s habitat and behavior. Upfront metaphors of sound and creative abuse of an app would fit well with the post-optimal idea.

To John Richards

Yes ... I like the idea of creating a circuit or a series of circuits to almost create a new species of bird that can creatively explore the similar qualities (tone/pitch/repetition) of bird vocalisations, as well as screw around with a bird app.

Thanks, L
COMPOSE A POMPOM

SAM TOLEY

the pompom. traditionally a round, soft object, usually of wool. created with the hands. their form and shape is recognisable, often emotive. the playful balls are traditionally brightly coloured and used ornamentally, as an embellishment or as a decorative figure to a garment.

the process for its formation, perhaps through its association with nostalgic and juvenile craft, is often dictated by each with their own idealistic, varying method to compose.

cardboard rounds, chair legs, hands, forks. there are many ways to shape a pompom.

fill the pompom with the potential for sound:
explore fibres, wires and materials to give them a voice. make it conductive or capacitive.
displace this round object within a circuit. consider materials for their acoustic properties. develop sounds through touch and interaction. amplify and process. make do, use up scraps. waste, useless shit, discarded wire, bristly copper, found materials. take this simplistic, accessible form and make it musical.

develop performances:
pile them up. clump them together. encompass the body, engulf the head. make grotesque lumps. it becomes more ugly, imposing. with its voice it begins to take on a character.
personified, almost. let them talk to the computer, should they wish. touch to intervene an algorithm or trigger a sample. the sonification of a pompom. play the pompom through a simple gesture of the body. create dense textures. use hands to create relationships between intertwined material. different weights and sizes evoke gestures, movements. shape rich timbres, interrupt complex rhythms.

pompom. feminist, anti-art, post-digital middle finger aesthetic? or yearning to create electronic music through handmade processes? currently, sought in pompoms.
a baby copper pompom. once coiled like an inductor?

photo: Sam Topley
UGLY WEEKENDER PARTICIPATING ARTISTS

JOHN RICHARDS
John Richards explores the idea of Dirty Electronics that focuses on shared experiences, ritual, gesture, touch and social interaction. In Dirty Electronics process and performance are inseparably bound. The ‘performance’ begins on the workbench devising instruments and is extended onto the stage through playing and exploring these instruments. Richards is primarily concerned with the performance of large-group electronic music and DIY electronics, and the idea of composing inside electronics. He has been commissioned to create sound devices for various arts organisations and festivals and has released a series of hand-held sythms on Mute Records.

ALEXANDRA MOON-AGE
Moon-age operates a sensual laboratory consisting of work as an art director/stylist for print and film as well as the creation of multi-media wonderlands. Moon-Age studied at the College of Fine Arts in Sydney and has since exhibited and curated shows in Sydney, Berlin and London, and worked with Sony Music, Iggy Azelia, Show Studio, and Channel 4 (UK). Currently she is directing a series of surreal short films known as ‘Theatrum Chemicum’ in collaboration with Berlin-based artists and contemporary dancers.

NATALIE KAY-THATCHER
Natalie Kay-Thancher is an illustrator, educator and founder of the Jiggling Atoms project, an interdisciplinary science and illustration project based on the collaboration between artists and research physicists. Having spent many years with an obsessive fascination for science and science fiction, her work explores the merging of science and imagination with image-making and workshops.

JENNIFER LUCY ALLAN
Jennifer Lucy Allan is the online editor for The Wire magazine where she writes, commissions and edits features, news and other articles. She hosts radio shows for Resonance FM and has led artist Q&As and discussion panels for The Wire at festivals and events including Unsound, Mutek, CTM and others. Allan runs Arc Light Editions, part of Multiverse Music, which started in 2013 with the first ever vinyl pressing of Arthur Russell’s Another Thought. In 2014, Arc Light Editions re-released Ingram Marshall’s Fog Tropes and Jone Takamäki Trio’s Universal Mind. She also freelances as a journalist for various magazines including Wired UK, Creative Review, Grand Designs and the Guardian Guide.

JIM FRIZE
Jim Frize graduated in Music, Technology and Innovation at De Montfort University, Leicester and is a former fellow of the Institute of Digital Innovation at Teesside University. In 2009, he co-founded Sonodrome Ltd, a technology company that designs electronic musical instruments and provides music and electronics workshops. Currently, Frize is undertaking a PhD at De Montfort University researching trans-hacking: how the process of hacking can lead to new forms of music and instruments. He has designed and built a number of electronic instruments and his work covers a wide range of technologies, from patching synthesisers in Max/MSP to constructing radio transmitters for amateur radio. He also has a passion for dub sirens and operates a custom
12-volt powered dub reggae sound system called Badaboombox. More recently he has developed instruments in collaboration with the Dirty Electronics and has worked on synthesisers for the Sonar music festival, Richard James (Aphex Twin) and Jon Furist (DMC Champion).

JOHN FASS
John Fass is a designer, researcher and lecturer in the Information Experience Design programme at the Royal College of Art, London. He has a background in designing for interaction and interfaces and has lived and worked in London, Milan, Berlin, and Brussels. He is in the process of completing a PhD at the Royal College of Art, and as a researcher his interests include the role for design in externalising digital experiences, and the semiotics of interaction. Fass is a Fellow of the RSA and member of the Design Research Society and has presented research at national and international conferences. He has been a visiting lecturer at the Bartlett School of Architecture and Bauhaus Dessau. At the Royal College of Art, John Fass runs the De-Computation elective for the Information Experience Design programme.

PHILLIP HENDERSON
Phillip Henderson & Eearth Rod is a core member of Reactor, he also works as a solo artist. His doctoral research investigated time in music. He has recorded noise, cut-ups and field recordings. His recent improvised work merges drone, arhythm and amelody. The drones usually beam out of the machinery like clashing lasers. The rhythms happily disregard time signatures while mercurial melodies spiral out of control abandoning their origin. Phillip Henderson & Eearth Rod continues to perform his series of Time Machine Lectures.

AMIT D PATEL (DUSHUME)
Amit D Patel, aka Dushume, is an experimental noise artist/musician from Leicester who is influenced by Asian underground music and DJ culture. His work focuses on performing and improvising with purpose built do-it-yourself instruments, sampling and looping techniques, and how re-mixing and re-editing approaches can shape composition. He is currently undertaking a PhD, Creating Noise in the Asian Underground, at the Music, Technology and Innovation Research Centre, De Montfort University, Leicester, UK.

SAM TOPLEY
Sam Topley is a musician exploring elements of craft and electronics for performance. Working from a make do and mend, waste not want not aesthetic, her work considers design, technology and the body to investigate ideas in wearable technology in music and performance. Topley is currently undertaking an MA by Research at the Music, Technology and Innovation Research Centre, De Montfort University. She performs with the Dirty Electronics Ensemble.

LUCY STEVENS
Lucy Stevens is a sound and visual artist inspired by bird behaviour; in particular bird vocalisation, identification and conservation. She records the sound of birdsong in order to identify bird species and visualise their songs via printmaking techniques and graphic illustration. Her work has been exhibited locally, as well as France and Sweden as part of artist residencies and commissions. In 2014, she was funded by Arts Council England to collaborate with musicians to create a vinyl EP, record sleeve and lyric book inspired by birdsong. In 2013, she recorded birdsong in Sweden and interpreted the sounds through monoprint to be exhibited at Nottingham
Trent University. Her involvement in a citizen science project with Cornell Lab of Ornithology, to explore why pigeons exist in a variety of colour morphs, resulted in the creation of two digital illustrations - both receiving award nominations.

LOZ ATKINSON
Loz Atkinson’s concept driven work has been depicted in paint, sculpture and digital media amongst others. She adapts different processes and techniques to explore a range of ideas and varied subject matter. Atkinson plays with perceptions of what is seen and not seen, using bold shape, line, form, colour and symbolism, and she is also interested in portraying a mystical quality, which expresses the paradox within concepts and circumstance to show beauty in unusual places. Detail to light and colour, and using layering techniques gives visual, as well as evocative depth within her digital and painted works. Loz Atkinson has also created many pieces for public art events throughout the UK. To date her work has helped raise awareness and funds for various wildlife and children’s charities.

LEILA HOUSTON
Leila Houston is an artist working in installation, sound, video and photography. She explores the boundaries of the kinds of biological, psychological and anthropological experience that can be created in a room. Her work investigates changing ambiances between places, sometimes developed by projecting or using photography and recording it again for a further development. This plays with notions of perception and explores the dimensions that affect our existence. Houston is currently looking at building a wall of mini motored objects to create a work with layers and echoes, is often intense and serene, circular, industrial and tribal, quietly haunting and yet makes us think of society and industry.

SMALL FOOD BAKERY
Small Food Bakery, run by artisan baker Kimberley Bell, is based at Primary Studios, Nottingham where they make small batch, slow fermented bread and pastries by hand. They have been commissioned to create various menus for arts events and host the fundraising gourmet banquet The Uncanny Canteen.
REACTOR

Reactor's work has involved the creation of various social microcosms - from a Utopian geodesic village to a self-help training cult - in which audiences and Reactor members co-participate. Each project has reconsidered what form the audience could take, and these different ideas of audience have changed alongside the group's evolution. Earlier in its history with projects such as Total GHAOS (2005) - which took the form of a fantasy totalitarian society built on a multileveled scaffolding structure - there was a militant expectancy for a fully participating audience, and it appeared that we would control this through the Reactor Party. Whereas, in projects such as The Green Man & Regular Fellows (2011) - which took the form of a pub, complete with adjoining function room, and played with the traditions, regularity and conventions of the 'public house' - there was a more a relaxed approach, building into the work less active positions that could be considered a watching audience. More recently still, Reactor has put these live works 'on hold' whilst we develop a new series of videos.

The group also curate series of events - of which this Ugly Weekender is one - entitled Reactor Halls at Primary in Nottingham (UK). This experimental programme of live performance, film and music events features Pil & Galia Kollectiv, Daniel Oliver, Eerth Rod, AAS, Juneau Projects, Kathy Noble, Ryan Jordan, Plastique Fantastique, Jennet Thomas, Benedict Drew, Rammel Club, Jenny Moore and Graham Dunning.

PRIMARY

Primary is an artist-led space that supports creative research through artist studios and residencies, public exhibitions and events.