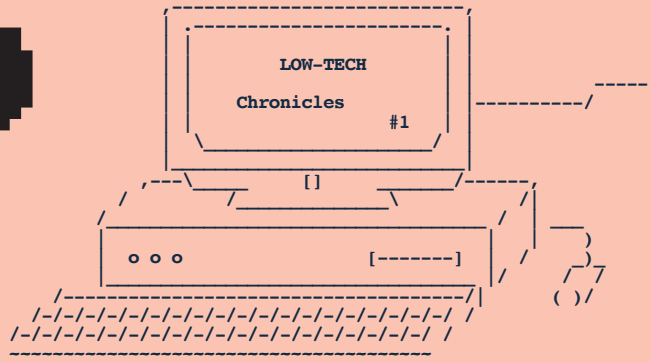
LOW-TECH CHRONICLES

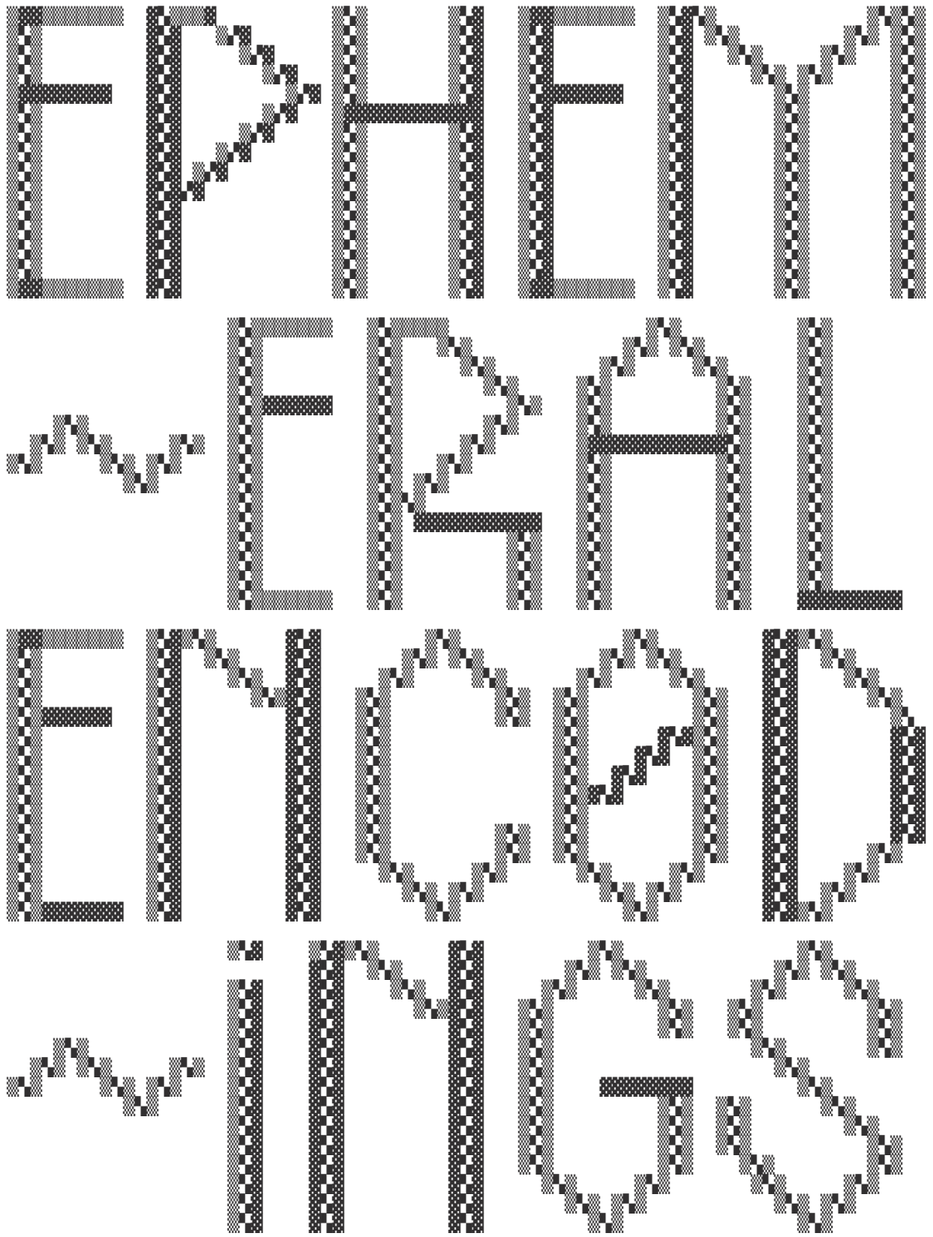
EPHEM-ERAL ENCOD-INGS

#1



A COLLECTION OF

Stories about the sound of computer activity



#1: Ephemeral Encodings

How can sound contribute in restoring our relationship with the material world of computation now that (operational) sounds are disappearing? ---------- ---------- This first issue consists of a collection of stories and reader that revolves around the sound of computer activity. For this part, each contributor was invited to share a vivid memory or vague experience on how sound connected them to the material world of computation and/or digital networking. Each contributor provided a piece of audio and an image with their text which formed the starting point of this format.

MANUAL: HOW TO OPERATE
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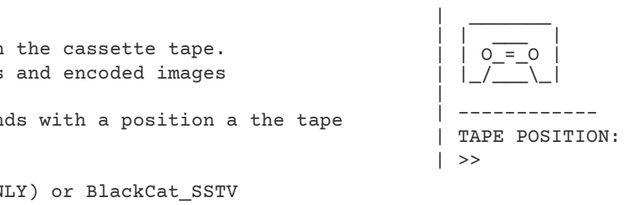
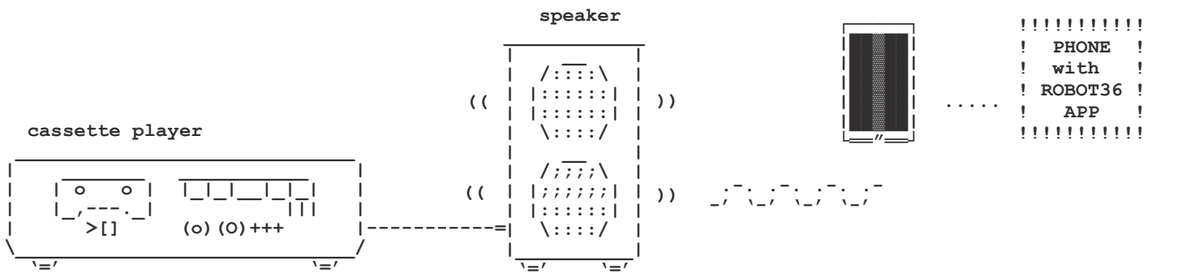
1. Each story/anecdote comes with audio content on the cassette tape.
2. This audio content consists of both sound bytes and encoded images
   (modulated into SSTV audio format)
3. The TAPE POSITION on listen each page corresponds with a position a the tape



TO DECODE THE IMAGES
- download the ROBOT36 app (recommended/ANDROID ONLY) or BlackCat_SSTV
- open the APPlication
- place/hold your phone near the speakers while playing the audio
- The APPlication will pick up the SSTV audio signals and decode the images

! important:
- the encoding quality is based on many factors:
  the quality of your microphone, speakers, tape player, your physical distance, volume, etc.
- experiment with finding the right position and angle to pick up the signal
- ambient sounds, noise, speech etc. will interfere with the ‘downloading’ process)
- the volume can be low!



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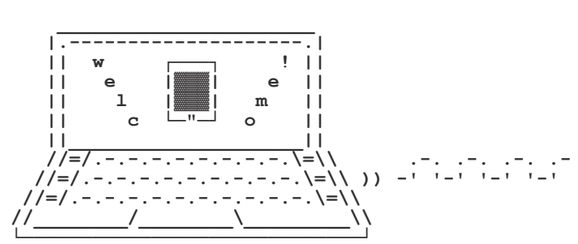
ONLINE CONTENT

- repository of used tools
- links and resources
- modulate own images
- more about this issue & series

ADD OWN STORY!
www.low-tech-chronicles.net/



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A15: Patrick Lichty - Vicapore/Duntoria
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A18: UTZ - Beep to Boot

SIDE B: Clicks, Beeps, Buzzes, & Orchestras

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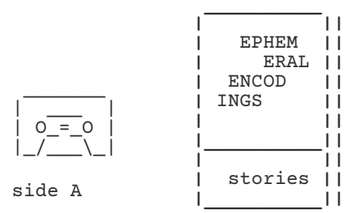
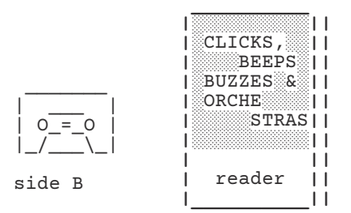
B03: Anecdote#3 - The Violent Sound of Networking
B04: Anecdote#4 - A Fanboy
B05: Anecdote#5 - Accessing the Internet by Means of Brute Force
B06: Anecdote#6 - The Silent Threat
B07: Anecdote#7 - A Deep Sigh from Within

--- 18 Minutes of Ambient Computer Sounds





Sebastian Tomczak
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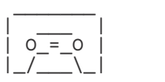
FAMILY HOME COMPUTING

Sebastian Tomczak writes music and makes things under the name little-scale. He has completed a PhD in chiptune and currently teaches sound engineering, music technology and hardware hacking at the University of Adelaide.

I owe much of my fascination and love of computers and technology to my late father. One of my earliest memories is sitting in our small suburban home near Sydney, tucked away in the basement when I was maybe four or five years old. My dad and I would spend hours on the Commodore 64, where he would program games for me to play, with simple animations and the warm sounds of the legendary SID chip. These memories are full of love and bonding for me.

What has really cemented these memories as something special is not only the sounds that the computer was generating, but also the sounds that were generated by using the computer - the click-clacking of the keys, the whirring of the large disc drives, and even the bleeping of a slow speed dial-up modem. These sounds have really made an unbreakable connection between feeling safe and cared for, and the use of technology (especially from the 8-bit era).

I have gone on to complete a PhD in chiptune, and I strongly believe that these very early memories - especially the sounds of the computer and of using it - has led me down this path. The SID chip remains one of my favourite sound chips and I still have and use at least three Commodore 64 machines.



TAPE POSITION:
>> A01

sound: littlescale_c64.wav
image: little-scale_c64_4_3.jpg

Aymeric Mansoux
~~~~~~~~~~~~~~~

Audio leakage in the age of soggy cheesecakes

ultrageranium
-
post.lurk.org/@320x200
bleu255.com/~aymeric/

Surely when we speak about computer sounds, we first think of mechanical bleeps on the one hand or interface/notification bloops on the other. But between these two hardware and software extremes, there is a whole world of unsuspected loudness waiting to be discovered. Specially if you are a laptop user, you may have already experienced some crackling tiny sounds, weird buzzing, and background noises coming from your machine. You may have surely told yourself “Blimey! What a manky design this is, init!” while secretly binge watching The Great British Bake Off season 4 for the third time. Well, well, well, as it turns out, these noises are much more than a simple acoustic annoyance. They are, my friend, the direct computational materialisation of your questionable hobby. Indeed, usually these cracks, buzzes and other high pitched whines are in reality the capacitors and coils vibrating. Why are they vibrating and when and following what patterns, will of course vary from one machine to another.

For instance I had a dear Thinkpad X61 that was gifted with the amazing feature of generating different kind of whine patterns when the CPU was idling. That was great because I totally got used to it as a way to give me insights on what was going on in the OS. Whenever I was doing something relatively modest in CPU usage, and if suddenly the laptop became completely silent, I *knew* it was up to no good, and I would quickly inspect what kind of dodgy process was awake and eating preciou, my *precious*, cycles. This was usually followed by a prompt process kill and a much anticipated return to soothing whines. With time I really became a laptop whisperer. Sometimes I would overhear someone’s noisy machine in a quiet space. I would then drop everything and start running towards the device, then put my finger on the slightly panicked person’s mouth “shhhhhhhhhhhhhhhhh, your low rated ceramic disk capacitor is trying to tell us something. Come closer, there, there... What are you trying to tell us little friend?”. Some other laptop whisperers have even pushed their unhealthy interest in succeeding extracting decryption keys just by listening to a machine (CHECKMATE AIR GAP OPSEC! GLORIOUS DOI 10.1007/978-3-662-44371-2_25). Yes. It is what it is.

These days, everything is crap and broken anyway. So, long story short, next time you’re watching, alone, your favorite cooking show, over Tor, thinking you’re safe... Think again! You never know when your chatty little electronic friends decide to leak your dubious interest into crème pâtissière...

TAPE POSITION:
>> A02

sound: paul.mp3
image: theyknow.jpeg
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Dennis de Bel
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Dennis de Bel (1984, Rotterdam, NL) is a hands-on artistic researcher, educator and radio amateur. His practice oscillates between various configurations of collaborations focusing on collectively exploring hardware, software and various forms of waves.
-
dennisdebel.nl
homebrewserver.club
varia.zone

Rumbling clouds
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Dark clouds are packing in the skies above me, indicating I have to end my recording soon.

Ironically I am recording the sound of a data center, the backbone of what is often referred to as the ‘cloud’. Historically appearing as symbols in technical drawings around 1994 indicating another part of the network (1), the cloud as metaphor is now synonymous with the ominous availability of digital data, backups, scalable computing solutions and content delivery networks.

Packing my bags I can’t help overhear the locals taking a stroll in the lush green area complaining about the noisy datacenter keeping them awake at night.

While smartphones, tablets and laptops processing power and energy efficiency has increased, they seem to have become practically silent over the years. Gone are the days of loud desktop computer towers, let alone the cacophony of rooms full of (tele)typist.

Next to our data being consumed by the cloud, in a tactic often not much different from ransomware, our devices have become more capable at processing more data as well. This data has to come from somewhere and it can’t be helped to think part of this noise as well as the people associated with data processing has been offset or outsourced to human-less data centers, both contributing to- and further eroding the perception of the cloud as a light, neutral, ephemeral, ominous, invisible entity.

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1). https://en.wikipedia.org/wiki/Cloud_computing#Origin_of_the_Cloud_symbol, retrieved sun 6 june 2021.

[Image] Like dinosaur carcasses scattered across the landscape, these temporary looking data-hangars can be found next to the the train tracks in Rotterdam and Breda. These particular buildings are part of the Prorail data network, the only operational one of the two is designated ‘BT190’, or British Telecom 190’. The one in Breda points its antennae towards an also quiet KPN neighborhood switching house. Listening to the BT190 recording you can clearly hear nature closing in. Let me know if you have seen any of these structures elsewhere in The Netherlands or world.

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TAPE POSITION:
>> A03

sound: LOOP.mp3
image 0-4.jpg

Mariëtte Groot
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Mariëtte Groot is a curator, organizer, musician, sound freak and owner of Underbelly Soundartmedia: a mobile and on-line store specializing in avant-garde and outsider art in the form of books, fanzines, records, magazines, and films.
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worm.org/
underbelly.nu

Dream Machine
“~“”~“~“~“~“~

I have been a radio-freak all my life; and I cherish the old-school radios in my house. For example I have a radio alarm clock by my bedside called SONY Dream Machine, since the early 1990s. The radio signal can be switched to either AM or FM. There are hardly any stations to be found anymore on the AM frequency, but there are plenty tstill on the FM waves, although sometimes I have to hold the little antenna wire and extend it with my own body to improve the reception of specific stations.
When listening late at night, actions like turning on the bedlight, or plugging in my phone to charge, all disturb the sound, but instead of sending the Dream Machine to the antiques market, I just adapt to those limitations, either living with the crackle and hiss, or leaving other gadgets switched off.
Long ago I always had it tuned into a rock music radio station to ensure I would really wake up once it started playing, no mellow or classical music would work. These days, news radio does the job, as there are interesting, dynamic and snappy news programmes in the morning on the Dutch public broadcasting platform.
A funny phenomenon occurs when I get out of bed and out of the room where the Dream Machine is still playing. It gets louder when heard from other parts of the house. My theory is that the hallway next to the bedroom, somehow acts as a resonator. I really hope my neighbours are not disturbed by all the snappy news items, radio jingles and commercials that don’t seem so loud by the bedside; for me this morning ritual is a pleasant way to start the day.

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TAPE POSITION:
>> A04

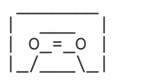
Sound: Het_geluid.wav
image: 369213420753423_n.jpg

Dustin Long

Dustin Long is a software engineer and game designer based in New York City. He enjoys focusing on retro and low-level technology.
-
dustmop.io

Ghost Sounds

I don’t remember when was the first time I noticed it, but I was certainly a young age. The sensation of walking into a nearly silent room, and without seeing anything in particular, realizing that a TV was turned on but not receiving signal. Perhaps someone had shut off a video game system or the cable box receiver, but neglected to power off the television as well. These old machines filled with cathode ray tubes would produce the most subtle buzz in this state, barely overlapping with the range of human hearing, sometimes not at all for older adults. As a child, it felt like a low-key superpower I had discovered, especially considering the noise was so faint it almost couldn’t be heard. Rather, it would arise as an illusive perception, as a feeling like being touched by a ghost. These days, as such TVs become exceedingly rare, replaced by silent monitors and displays, and as I’ve aged out of my youthful superpowers, I occasionally reflect on the absence of the technological spectres that used to haunt our homes.



TAPE POSITION:
>> A05

sound: CTR-buzzing.wav
image screennes.jpg

Florian Cramer

Florian Cramer, reader in 21st century visual culture/Autonomous Practices, Willem de Kooning Academy & Piet Zwart Institute, Rotterdam University of Applied Sciences.
-
www.floriancramer.nl

COIL WHINE

When rendering video files with my previous graphics card and a program that made heavy use of it, I often heard coil whine: a high-pitch whistling, caused by electricity going through the card’s chip wiring and making it vibrate. Likely, it is the only sound computers and other electronic devices make that is not created by motors (such as those of fans and spinning disk drives).

Coil whine is the accidental sonification of a chip’s internal activity. One can literally hear the chip working. Under sudden high computation loads, for example when moving a real-time rendered visual on a screen, the whine changes in volume and pitch as if it was accompanying the activity with an instantaneous movie soundtrack. The sounds coil whine makes remind of highway traffic run through a pitch changer. It thus corresponds to the fake city scapes of internal chip structures photographed with a macro lens.

Coil whine, by making a chip’s labor audible, reminds listeners that there is no such thing as digital hardware, but only analog electricity traveling through circuits whose oscillation becomes (analog) sound waves; that zeros and ones are being abstracted from these flows of electricity just like reading “1 liter” from a measuring cup filled with water abstracts from the actual quantity of water, which in reality is never precisely one liter.

Coil whine tells how computing consumes energy, emits heat, involves physical wear and therefore is anything but “virtual” or “immaterial”.

I have intentionally refrained from aesthetic, ethical, economic and political interpretations of coil whine, but leave it to you to make them.

[sound file] coil whine, 30 seconds in original pitch + 30 seconds at 5 octaves lower to simulate traffic noise

original source: “What does Coil Whine sound like?” by PhilsComputerLab, Nov 24, 2020, https://www.youtube.com/watch?v=ZT-6PzY8bT1Q

[picture] “i486 Full Die” by jigpu, licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0), https://creativecommons.org/licenses/by-nc-sa/2.0/

www.flickr.com/photos/82805519@N00/422704752/in/photostream/

TAPE POSITION:
>> A06

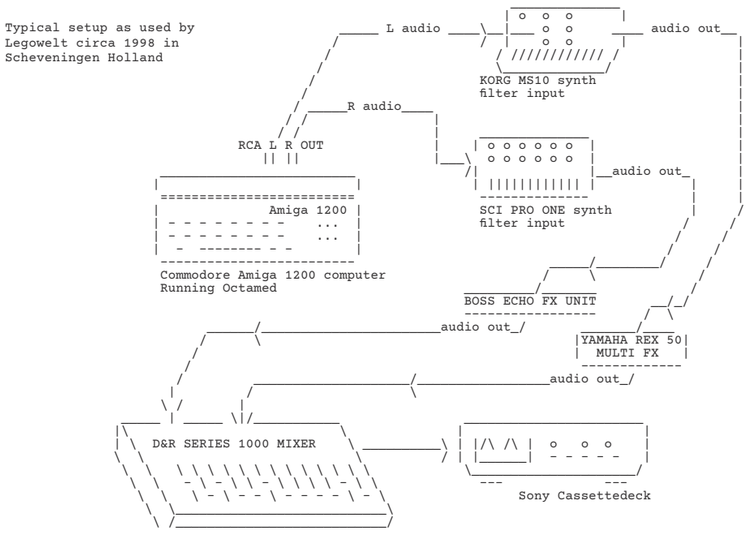
Sound:coil_whine.flac
image:i486_Full_Die.jpg

Danny Wolfers
-=-=-=-=-=-=

Danny Wolfers (a.k.a. Legowelt) is a Dutch electronic musician who describes his musical style as “a hybrid form of slam jack combined with deep Chicago house, romantic ghetto technofunk and EuroHorror Soundtrack.”
Born: a long time ago when Star Wars used to be good / School: Bovine University North Dakota / Previous Jobs: Amiga programmer, RPG Dungeon Master / Current Jobs: Music Producer, CEO of Pacific Micro International Software™ / Hobbies: Synthesizers, Programming text adventures for the Commodore 64
-
legowelt.org

The lost magic noise of computer artefacts

Once upon a time let’s say about two and a half decennia ago, this would most of the time not be the case. Especially if you had a Commodore Amiga with its direct stereo RCA outputs or a PC with something like a Sound Blaster audio card jamming your latest tune from its minijack output. Digital artefacts in the computer would seep through the audio outputs. Hard disks operating, screens refreshing, chips crunching, obscure computational processes and even just moving the mouse pointer would all have their distinct sounds that would softly ‘bleed’ into the audio path. Static buzzes, clicks, crackling, humming drones and a guaranteed medium or high noise floor would always be audible in the background. It never felt out of place and in time, they became an indispensable part of your sound. They were the sounds of a ‘living’ computer, a ‘sentient’ being with its own quirks and moods. It was your friend, your fellow musician, your co-producer… whatever quirks it felt like adding to your music you would respect.
It was a comforting sound, the background noise of the mystery of electronic music production. Magic started to happen when these artefacts were put through filters, delays and reverbs. Hidden in the shadow of the music you were making these sounds would take on a life of their own. One must take in consideration that at that time these effects were mostly outboard or an old analog synth with a filter input. You would connect the computer outputs through an outboard unit and mixer and record on tape, DAT or Minidisc. VST software synths and effects didn’t really exist: it was mostly crunchy short samples played in a tracker sequencer. The little background clicks and buzzes became a meandering soothing stream of random pleasant sounds, a soundscape of circuits, a field recording of a digital forest. It would ‘glue’ the music that floated on top of it together and even the most simplistic mindless arrangements would be inhibited with a sparkle of sorcery.
Today I often hear new music that sounds so clinically perfect, so pristinely polished with not one artefact in sight for a thousand miles… and it is so mind-bogglingly boring, like a plastic sterile vacuum of nothingness. Every day the world is flooded with thousands of soulless electronic music tracks that could be injected with life. If only they were made on an old noisy computer, our forgotten friend and co-producer that has been lost in the sands of time.



Sound: AMIGA_1200_Digital artefacts.wav
image: amiga1200_octamed.jpg

TAPE POSITION:
>> A07

joak
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joak is Joseph Oliver Anton Knierzinger. At the moment he works on different alogisms and algorithms in Vienna.

2021-05-31
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This May we had a light breeze in Vienna on some days. In 1955, some engineers of the Vienna University of Technology started building the so-called “Mailüfterl” (a May breeze) computer. Other universities had mainframe computers called “Whirlwind” or “Typhoon”, but for the people in Vienna a breeze was enough. The breeze was not really strong and not really fast, even though it had thousands of Philips transistors in its circuits. Calculations for quantitative research therefore had to run all night under conditions of hardware errors and software bugs. To hear whether the “Mailüfterl” was still in the calculations, the main accumulator was connected to the telephone. During the night someone only had to call and could hear if the computation was still running.
However, in this moment, as I write these lines, I hear a slight constant hissing and buzzing in my ears. I look up and I see a server rack full of various routers and other equipment. It is part of the network infrastructure of the Metalab Hackerspace in Vienna and connects this place with other larger networks. A cable goes up to the roof of the building and connects wireless to another node in the Funkfeuer net (a community network above the rooftops of Vienna). From there, the Metalab also gets its access to the so-called internet. The fans of the equipment in the rack take care of the by-product heat of the network and computer infrastructure. Even if the ICT devices could be more silent in the future, we will always be able to feel (and hear) their waste heat.

TAPE POSITION:
>> A08

Sound:rack-metalab.ogv
image:rack-metalab.jpeg

Zach Mandeville
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Zach is the web master of https://coolguy.website, and https://solarpunk.cool. He lives in Te Whanganui-a-Tara, Aotearoa New Zealand.

AOL Instant Messenger Open Door Sound

My crush left for college on the east coast, and I convinced myself that the distance made my love even more romantic. We talked on AOL instant messenger in the small patches when our time zones aligned, conversations that felt significant in the moment, but, were I to read the chats today, would likely be pitifully banal.

When a friend came online, AIM played the sound of a door creaking open. Whenever I heard this, I would run to the computer to see if it was her screenname. I would wait several minutes before sending a message, believing there to be a perfect span of time that indicated I was doing something cool and engrossing before she hopped on. The absolute best was to hear the door creak and then the immediate ping of a new message— the digital equivalent of a friend barging into your room excited, the exuberance of knowing she was as excited to see my name as I was to see hers. The worst was the creak, a pause, and then a slam: she came online, she saw my name, but it wasn't the name she was hoping for.

The space between the creak and the ping held so much meaning. We couldn't read each other's body language, and would not say how we felt directly, so had to determine feelings through the span between sounds, a highly emotional (and highly inaccurate) sonar.

The sound effect is archived on YouTube, through the Athena Laboratories Media Dept[1]. It is the most popular video on their channel. I can understand this, but it isn't a sound I want to listen to myself. Hearing the door in isolation is like a melody that keeps ascending without resolution, it fills the body like a held breath but never gives the exhale.

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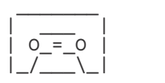
1 - https://www.youtube.com/watch?v=iq3j08Jg-EA



TAPE POSITION:
>> A09

sound: AOL_AIM Door Open Sound-iq3j08Jg-EA.mp3
image: AOL-Instant-Messenger-icon.png

Goto 80
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Goto80 is an "old media artist" from Sweden who works with music, art and research. Since the 90's he has released thousands songs in many absurd styles and formats. He currently focuses on live improvised C64 music, robotic arms, and ASCII graffiti.
-
www.goto80.com/

DROOLING DOG

One of my most memorable computer sounds is not really a computer sound, but a telephone sound: the noisy sound of success when I managed to call another computer and connect to it. Me and my brother had bought a small modem together with a friend in the area, and we had shared custody week by week. So we had every second week, and whenever my older brother wasn't in his room, I had the chance of Connecting People™. Since he was a chiptune FM-synth MIDI geek, that wasn't as often as this geek would have wanted...

I used the modem to call computer bulletin boards in the area, which were run by the older kids. They had set up a computer at home to respond to incoming calls so that we, the callers, could hang out in their bulletin board system and download stuff and chat and whatever. The adults were clueless and absent so I could bum around on these systems and be an older teenager, a superstar, a friend and an asshole. All at once! VERY exciting. So whenever you would get through to one of these bulletin boards. If they were busy you would just tell the computer to re-dial until you'd get through. So, getting connected could be very, very exciting! The hacker was back! (in reality: that silly kid was back).

The sound that accompanied this success however, sounded nothing like success. It was basically the opposite, and then some. It was a gruesome digital-to-analogue scream of eternal doom. But I was just a drooling modem dog. I knew that whenever the sound of eternal doom was there, I would get food for thought and time for fun.

The sound wasn't exactly the same every time. You had two computers screaming at each other through aged phone lines and baby protocols, so sometimes things didn't work. Those erroneous sounds will probably never be preserved, and lost forever. I don't mind though. Drooling dog <3 perfect doom.

TAPE POSITION:
>> A10

sound:16475__jlew__dialup.mp3
image:186841602_523423402027662_8352934208949410158_n.png

Tijs Ham
`,`,`,`,`

Tijs Ham is a Sound Artist from the Netherlands working in the field of live electronic music and sound art. He is the co-founder of the ‘Soundlings Collective’ and has worked for the STEIM foundation as an artist, organizer as well as a member of their artistic board. As ‘Tapage’ he has released a long string of records on various international labels. His current artistic practice focuses on the use of chaotic processes within the development of new electronic music instruments, compositions, and performances which is also the driving theme of his Ph.D. in Artistic Research at the UiB.

STATIC CODE
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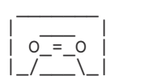
A sizable crowd is gathering in the dimly lit, cellar-like space, ready to enjoy an evening of music, dance, and drinks. I arrived about half an hour earlier, armed with just a laptop. It’s all I really need to perform a live-coded set of algorithmic music. But, as soon as I connect to the sound system I sense an issue arising. The ancient power sockets have turned my trusted instrument into a statically charged beacon. Every touch on the keyboard pulsates through my arms, strangely fusing the usually disembodied act of coding with an electric physicality. Usually, this kind of situation would be dealt with during a soundcheck. Mumbling technicians, digging through piles of cables and mic stands to find an extension cord that would solve the problem easily. Not today. The audience is already eagerly waiting for the speakers to awaken and pummel them with disjointed sonic pressure waves. Unwilling to disappoint, my fingertips make contact with the laptop, and the performance commences. The muscles above my wrists appear to radiate slightly as the first line of code appears on the screen:

```
Ndef(\sine, {SinOsc.ar([50, 51],0, 0.1)}).play(0, 2);
```

A low bass note is pushed out of the sound system, blending in with the static field that massages my limbs. This could work. As I continue to type, the soundscape forms an accompaniment to my double role as performer and antenna. Somehow the sensation helps to channel the intensity of the performance. Code becoming electric. Becoming electricity. As the concert draws to a close, I’m dazed and disoriented, glad to have captured a literal spark of inspiration, and simultaneously grateful the laptop survived the occasion without a glitch.



TAPE POSITION:
>> A11

sound: Tapage-Livecoding (Excerpt).wav
image: 67748_420291484711213_1762273179_n.jpg

Claire Kwong

Claire Kwong makes interactive art to dramatize her personal experience with technology. She works with computation to create performances and interactive experiences. She also creates live visuals for electronic music shows. Claire has exhibited internationally at events including A MAZE (DE), JSNation (NL), Beta Public (UK), and PlayUK (RS). She received a Masters in Computational Arts from Goldsmiths, University of London. Claire lives in New York City.
-
clairekwong.com

Projector Hum

I am standing in a dark room. My body holds still with anticipation. Suddenly the machine in front of me gasps. A flicker of light. A loud whirr and a blue glow. I’m blinded, with only the hum of the machine to guide me. Then I, too, start coming to life.

I used to perform in front of a projector. I would capture my body live, process the image with my computer, and project it back onto me. I loved the uncanny texture of light projected onto skin. I’d flail before the light and fight with my own reflection. I never had a soundtrack, so I would rely on the sounds of my breathing and the whirr of the projector. It would inhale, exhale, and hyperventilate to keep up with me as it processed my movement. These sounds were amplified by the silence of the audience. My breaths opposite those of the machine. A duet.

In those moments I became a self I rarely was. Performing brought out something feral in me that I couldn’t access in real life. Similarly, most machines I used on a daily basis were silent. But when I forced myself and my machines into unnatural situations, it revealed the anima in both of us. When it performed with me, my projector became a living being.

I wonder if I’ll ever be so bold again. I’ve mellowed as I’ve grown older, and my projector is falling apart after traveling with me around the world. I don’t know when live performance will return after the pandemic. But a part of me longs to stand in front of my projector again and listen to it breathe.

TAPE POSITION:
>> A12

sound: Projector Hum.m4a
image: Projector Hum.png

Hans Kulk
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Hans Kulk is an artist based in ‘s-Hertogenbosch (NL). His works consist of spatial sounds in collaborations with visual artists (ceramics, video, painting, spatial objects, dance). Kulk has been a performing musician (drums, bass, guitar, percussion) in Jazz, Improvised Music, Afro-Cuban music, Fusion, Contemporary music) until 2007. From 1993-2008, Kulk taught analogue synthesis and ear training at Music Technology Hilversum (HKU). Currently, he is teaching Analogue sound synthesis and processing at Willem Twee studios in ‘s-Hertogenbosch.

The Analogue Computer
~^~^~^~^~^~^~^~^~^~^~

While intensively working with analogue modular synthesizers (ARP 2600 & 2500) during the 1980’s I did a lot of literature research. In one book the author Joel Chadabe explained that such synthesizers “were conceptually akin to analogue computers. That triggered my curiosity: computing with analogue circuits? What kind of machines are we talking about? What is the in- and output and how is data processed? To my luck I found a surplus operation manual of one such a machine: the Hitachi 240. By getting into this new field I slowly started to understand that it could be used with analogue modular synths as an integrated system! After some phone calls I found two 240’s in a technical high school basement, and early 1989 the actual research could start.

The following years I’ve visited many technical university libraries for analogue computation literature, and discovered a lot. Not only the principles of operation but oscilloscope visuals as well; extended techniques of presenting the computation solutions. The resulting (in parallel) available voltages could interface perfectly with the ARP’s.It became clear to me that quite a lot of modular synthesizer functions originated from analogue computers: Sample & Hold; Multi-mode filters; Multipliers; Quadrature oscillators etc. As only a single colleague actually new about analogue computers it was time to spread the word; I did various lectures at Sonology (The Hague) and Music Technology (Hilversum) and even a music performance at the Arnhem Technical High School. However, for actual live performances these 100 kilo “desktop” computers would be unpractical.

Nowadays the two Hitachi 240 analogue computers are part of studio 1 at Willem Twee studios (WTS) ‘s-Hertogenbosch.Being fully operational it is used for workshops, research and real sound synthesis integrated with the other analogue signal processing equipment. Although the actual 240 machine is transistorized and quiet (no cooling fans) there are some specific sounds that have accompanied me now for 42 years :-)
1- loading the program: inserting and locking the exchangeable patch board;
2- the mode control switches and relays: Compute/Reset/Hold and coefficient set or slave mode;
3- setting the coefficients: turning one of 70 ten-turn potentiometers to a certain value.

Hearing these sounds remind me of the still on-going research adventure that started with a few words in a book.
All about analogue computers by my friend Bernd Ulmann: http://www.analogmuseum.org/english/

[image] by Jo Scherpenisse: a customized dual-analogue computer in analogue studio BEA-5 at the Institute for Sonology, The Hague, 1994

[sound] samples:
1- loading patch program
2- Mode control
3- setting coefficients

TAPE POSITION:
>> A13

TAPE POSITION: X
>> 00m00s

Sound: 3_sounds_from_the_Hitachi_240_analogue_computer.wav
image: 1.jpg

Olli Aarni
==*=*=*

Olli Aarni is an artist who works with sound, music, language and literature. His practice consists of audio pieces, music albums, live performances, installations, radio pieces, workshops, skateboard tricks and work as a publishing editor.

Auditory brushes
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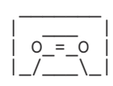
A while ago I started reminiscing about the computer games I used to play as a child. I went looking for gameplay videos of my favorite old shareware, freeware and commercial games on YouTube, eventually stumbling across a favorite of mine that I had completely forgotten about: a bitmap drawing program called Kid Pix. I instantly remembered the vibrant color scheme and some of the special brushes, but I had completely forgotten about the soundscape of the software.

In Kid Pix Studio each brush has its own sound that activates when using the brush. The sound and visual counterparts work together so that drawing with the program is equally pleasant on visual and auditory level. Using a brush triggers a sample that will either play once or loop as long as the drawing gesture will take. I remember using some of the brushes mainly because of their sound, and wanting to hear the sound for a specific amount of time also affects how the brush is being used.

As a kid I must have been aware of the sound being an essential part of drawing with the program, but I’m quite sure I never thought of it as a tool for musical composition. The sound vanished in the thin air when the button of the mouse was released, but the visual counterpart remained on the bitmap. To me the sounds revealed something about the inner workings of the computer and the program, and they also added another level of enjoyment to the process of drawing, if not the end result.

Listening back to the sounds of the Kid Pix Studio after so many years made me realise that their abstract, electronic and playful quality probably still informs my creative process on a subconscious level. I probably haven’t shaken off the idea of sound being but a dimension of an event that’s happening on many levels, such as the tactile and the auditory sensory levels, but also on some deep down mysterious level, such as under the hood of a computer, on the atomic level of the material world, etc.

[image] screen cap from https://youtu.be/CmLn7dfM_ko
[sound] Short electronic composition inspired by Kid Pix brushes



TAPE POSITION:
>> A14

Sound: olli aarni - imaginary kid pix brushes.wav
image: Screen_Shot_2021-06-07_at 14.16.18.png

Patrick Lichty
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Patrick Lichty is an intermedia artist dealing with mediation, the physical and the virtual, and media archaeology. Sound is also a fascination in that my vision has been impaired parts of my life. In 2006 SSTV became a major medium in my practice.

Vicapore/Duntoria
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[image/sound] The work is from Vicapore/Duntoria which was done with Bill Bartlett, Peggy Cady, Doug Jarvis and more, broadcast between Singapore, Victoria BC, and Dundee Scotland.

Sarah Grant
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Sarah Grant is an artist and professor of new media living in Berlin. Her teaching and arts practice works with the electromagnetic spectrum and computer networks as artistic material, social habitat, and political landscape. Since 2015, she's organized the Radical Networks conference in New York and Berlin, a community conference for experiments in telecommunications.
-
radicalnetworks.org/

* Diss-connected *
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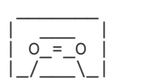
One of the most formative experiences of my life was dialing into America Online in the early 90s as a teenager. The experience of being able to chat with someone on the other side of the world like it was nothing, to randomly email people, download files, or get my tarot cards read, was the opening of an entire other dimension of reality. I always wanted to be online, to be connected. Often to strangers, perhaps, but that made it even more exciting. The few of us who self-selected to be online together suggested having something in common, somehow.

To be sure, most of the people in my AOL Instant Messenger friend list were people I had never met IRL, but there were of course a few who were real life friends, including boyfriends.

At the start of a new relationship, every time I heard the AOL open door sound, I would get a little adrenaline rush, hoping it would be my boyfriend. And when me and my boyfriend would fight, and he'd rage quit the chat, followed by the closing door sound, oh how my stomach sank at the sound of that.

Worse yet would be the sound of that final closing door after we had broken up, had a few more fights, and then agreed to never speak again.

I still feel a sense of emptiness at the sound of that door closing, even after having not heard it in nearly two decades.



TAPE POSITION:
>> A15

Sound: dtb.mp3
image: dtc.jpeg

TAPE POSITION:
>> A16

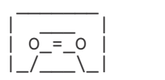
sound: exit-aim.mp3
image: shut.png

Raquel Meyers

KYBSlöjd practicer
and typist beyond the
scrolling horizon.
-
www.raquelmeyers.com

Keys of Fury
<><><><><><>

The Commodore 64 has bring me a lot text-mode joy. It defines my artistic practice as KYBDslöjd [mecanografía expandida] whose significance can be defined roughly as <drawing and crafting by typing> . The C64 typing sound always take me into another world in which a CRT television with a black screen and a blinking dot are waiting to be full-filled with PETSCII. All you need is just your imagination and your fingers to type.



TAPE POSITION:
>> A17

sound: RaquelMeyers_KYBDslöjd.wav
image: RaquelMeyers_KYBDslöjd.jpg

UTZ
=+=

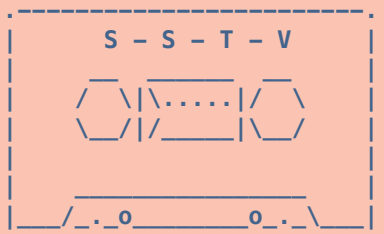
Micha “utz” Neidel develops music tools for old computers and video game consoles. When not sweating over some assembly code for once, he might compose some chiptunes instead, and release them under his moniker “irrlicht project”.

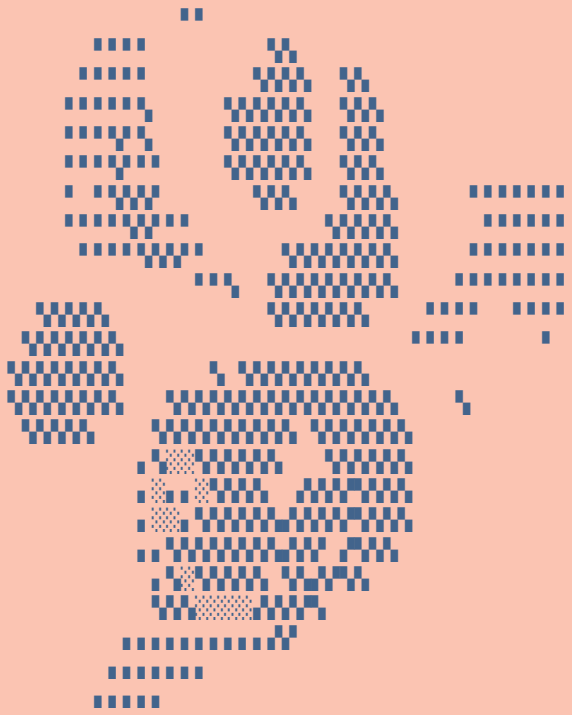
Beep to Boot
=+=+=+=+=+=+

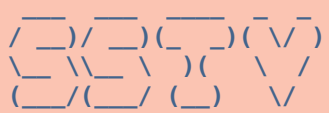
Computers were not a common sight in the time and place I grew up. So when I finally got introduced to them through computer class in school, even the simplest of things could spark joy and fascination. Things like the PC startup beep. The PCs at my school were notoriously unreliable, so one eventually acquired the skill of diagnosing the most common problems through the various beep sequences the machines would emit.
The real fun came once programming lessons were on the menu. Those were the days of Turbo Pascal, which bestowed upon my mischievous class buddy and me the power to *control* the PC Speaker. I’m not sure if the Sound() command was actually part of the curriculum, but either way I’m sure our poor teacher still curses the day we found out about it. The class exercises hardly ever a challenge for us, so we often finished in 15 minutes what was supposed to be a task for 45, which gave us half an hour to broaden our knowledge the field of computer studies. Or rather, annoy everyone in class with various cacophonies composed for the mighty PC Speaker. Beep-beep-beep... beeeeeeep! Our favourite were various “improvisations” on the US anthem, with lots of false notes.
Eventually the teacher gave in and just let us browse the internet instead, and the classroom fell silent again (apart from the frantic keyboard clacking and groaning produced by our less versed classmates while trying to solve the exercises). By that point however, those 1-bit beeps must have ingrained themselves into my brain somehow. In my free time, I went on to write a kind of sound effects generator for the PC Speaker. I still use similar kinds of devices for making music today.

TAPE POSITION:
>> A18

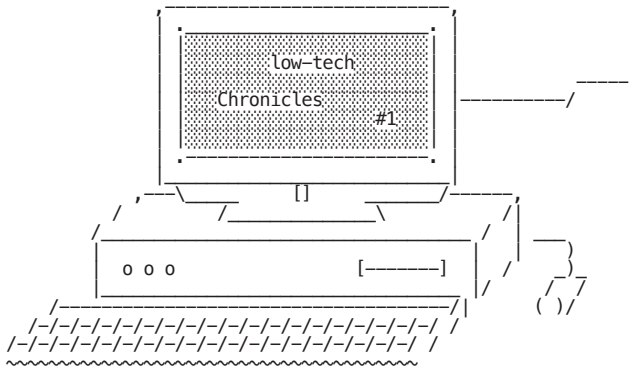
sound: tpsfx2.mp3
image: tpsfx(1).png







The Auditory Dimension of Computation



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