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Humans Thinking Like Machines - Incidental Media Art in the Swedish Welfare State

Tried conversation (engineers and artists). Found it didn't work. At the last minute, our profound differences (different attitudes toward time?) threatened performance. What changed matters, made conversation possible, produced cooperation, reinstated one's desire for continuity, etc., were things, dumb inanimate things (once in our hands they generated thought, speech, action)

John Cage "Art and Technology 1969"

In 1966, a group of Tanzanian exchange students in Sweden were treated to an unusual performance of early computer music. An IBM 1403 line printer, originally intended to print out forms and records for civic registration and tax collection, played them a rickety version of "Mungu Ibariki Afrika" (God Bless Africa), then recently selected as the national anthem of Tanzania.

I first stumbled on the story of Swedish tax bureaucrats bringing out music from their machines in a short text chronicling the technological development of the Swedish system for tax collection from "inkpen" to "computer brain"¹. An article written by a former administrative director of one of the first "county computer centers" in Sweden, Åke Johansson, by chance also a colleague and close friend of my late grandfather. This means my research has been personal as well as archival: through interviews with Åke and offline as well as online research, I've tried to map out the different actors and background contexts of this story. What is emerging is a network of a kind of early everyday media art which I here will explore as "incidental media art" taking place within the walls of workplaces such as banks, accounting companies and public administration offices. This is a kind of everyday creativity that is quite startling, given that it hails from the "mainframe" era of computers, long before today's networked digital environments and even before the advent of "personal computing". It would maybe be inevitable to explore this history in relation to a reflection on cybernetic frameworks, such as in the concept of the posthuman, as a way to conceptualize emergence beyond the autonomy of the human subject.² My example of the Swedish tax administration and the Tanzanian students may be characterized as following this path of thought, but at the same time it has a very concrete relationship to a colonisation-computerisation nexus which will rather guide my analysis here. It is my intention to show how such a dialectic may be useful for scrutinizing how we look upon subversion and appropriation, as concepts supposedly integral to media art histories.

"We can only speculate at the dark-skinned gentlemen's enchantment and wonder as they suddenly heard a chattering printer performing their national anthem. There were cries of surprise, tear jerked eyes and an unforgettable memory of polite and unbureaucratic Swedish bureaucracy."³

This display of "unbureaucratic Swedish bureaucracy", as Åke Johansson tells us, was actually initiated by his colleague Roy Brandhill, the musically gifted manager of the county

¹ Johansson, Åke. "Från Bläckpenna till Datorhjärna" *Deklarationen 100 år och andra tillbakablickar*. Riksskatteverket, Stockholm, 2003.

² Hayles, Katherine N. *How we became posthuman : virtual bodies in cybernetics, literature, and informatics*. Univ. of Chicago Press 1999.

³ Johansson. 2003. P. 107.

computer center in the Swedish small-town Västerås. When learning that students from Tanzania would pay a visit to his center, Brandhill proceeded to acquire the notes to “Mungi ibariki Afrika”, the Tanzanian national anthem. He translated the anthem into punch-cards which produced its melody through the 1403 line printer. The anthem was particularly relevant at the time, since Tanzania had just been formed as a state following the independence from British colonial rule of Tanganyika and Zanzibar in 1964.

The young Tanzanians were at the time part of a state-subsidized exchange project, as students of public and business administration at the Carlforsska upper secondary school in Västerås.⁴ As exotic guests in 1960’s smalltown Sweden, the West-African students naturally had to visit numerous companies and public institutions and among them, the brand new county computer center. This is of special significance since 1966 was actually the same year that Sweden launched its most ambitious computerization programme to date: the computerisation of the National civic registration and tax collection system. In its trial phase, the project was implemented in 19 local county centers, one of which was situated in Västerås, where an IBM 1401 Data Processing Unit had been set up.⁵ Typically located in the cellar of a public administration building, the county computer centers would contain the 1401 system’s bulky and noisy components: the CPU 1401 Processing Unit, the 1402 Card Read-Punch and finally the notorious 1403 Printer. The 1403 printer was one of the peripherals that made the 1401 system so successful as one of the first general purpose computing systems produced on a mass scale.⁶ It set a completely new standard in high-end printing due to its capability of printing up to 600 lines per second, a process which relied on a quickly revolving chain which was hit by a hammer, producing the desired characters – and a lot of noise as well. In general, apart from the IBM 1401 system’s novelty, personal accounts of the 1401 system in use continuously stress its capability of generating an incredible soundscape of *noise*. For example, opening the lid of the 1403 printer would reveal a sound described by some like that of “a machine gun”⁷. By probing old alt.newsgroup postings and personal web-pages of retired 1401 operators you can find countless accounts of this veritable “futurist orchestra”:

”Computer room or boiler factory?” (...) *It was loud too, and our computer room at the bank with 4-5 1401’s, all with their check sorters, printers, and card readers going at once would have had the noise pollution police all over us (...)* “
Former bank employee and mainframe computer salesman, Dave Nichols⁸

“THUM-SLAM-KERCHUNK-WHISH” (...) *One day I was in the machine room when all this noise suddenly stopped except for the sound of a 1403 printer spewing fanfold paper at high speed. (...) what I remember clearest is the sudden silence, not even the data cell, except for the swish of paper leaping from the printer.*
Engineer Peter Kaiser, Computer Center Systems Group.⁹

⁴ Mikael Sandaeus, Västerås city archives, e-mail correspondence, January 17 – September 29 2007. Photos from the exchange project, Västerås city archives.

⁵ p 10, Johansson, Magnus. *Smart, fast and beautiful : on rhetoric of technology and computing discourse in Sweden 1955-1995*. Linköping: Tema, Univ. 1997.

⁶ The model N1 of the 1403 was from 1967 onwards actually produced by the Swedish branch of IBM.

⁷ Hallberg, Tord-Jöran. P.278. *IT-Gryning. Svensk datahistoria från 1840- till 1960-talet*. Lund, Studentlitteratur, 2007.

⁸ Nichols, David. “IBM 1401 Computer” *David Nichols’ Place*
<<http://www.geocities.com/SiliconValley/Lakes/5705/1401.html>> (07-09-29)

⁹ “The IBM 2321 Data Cell Drive” *Columbia University Computing History*. Compiled by Frank da Cruz.
<<http://www.columbia.edu/acis/history/datacell.html>> (07-09-29)

This seemingly abstract structure betrays the fact that the music it produced was usually either classical, or American folk and easy-listening tunes: “Bolero”, “Blowin’ in the Wind”, “She’ll be coming around the mountain”, “Popeye the sailor man”, “Old MacDonald”, “Marseilleise”... Some of these old recordings survive today and has made the 1401 system machine come back to the public’s attention.¹⁷ The Icelandic composer Jóhann Jóhannsson, who in 2006 released a composition based on 1401 recordings by his father, suggests that the “singing” of the 1401 system can be seen as a way for the workers to “humanise” this opaque technology.¹⁸ As Jóhannsson’s evocative piece also suggests, this “humanising” might be read as relating to how there is a dialogue going on between man and machine. In the case of he 1403 playing “Mungu ibariki Afrika” in a Swedish office for tax administration, this is a dialogue capable of producing, not only an aesthetic representation, but a touching attempt at transcultural communication, years before computers entered the mainstream as everyday representational or communicative devices. The communicative aspect of this incidental media art is also quite startling, as it points us in the direction of a “decolonisation – computerisation” nexus which has seldom been fully explored. Two parallel trajectories of state development here meet and form a curious cultural exchange, one which has to do with de-colonisation and the emergence of post-colonial states and one which touches another kind of colonisation: that of between man and machine. Both processes involve rather complex and similar dialectics of coloniser and colonized which gives us a perspective on appropriation and subversion not so easily particularized, as it usually is, as acts of avante-gardism or activism, but rather rooted in the emergent qualities of everydaylife.

Re-reading the incident then of the 1403 playing “Mungu ibariki Afrika” to young and supposedly stunned Tanzanians, the traditional Tanzanian concept of “N’goma” resonates ironically. As musicologist Krister Malm writes in a comparative study of Tanzanian and Swedish folk-musical cultures, Tanzanian culture has no specific word for music, the widespread cultural form instead being “N’goma” (also Engoma), meaning literally “drum”, but actually also used for a more general description of the integration of work and everyday life with drama, dance and rhythm.¹⁹ With Tanganyika’s and Zanzibar’s independence from colonial rule being established in the early sixties, culminating in the formation of the state of Tanzania in 1964, Malm describes how there came an inevitable reconfiguration of N’goma traditions through the nationalisation of the region’s folk cultures. This resembles a kind of postcolonial nationalism which could be described as “haunted” by the dialectics of coloniser and colonized. To speak with Fanon, de-colonisation processes are not “pure” resistances but rather marked by their conflicting desires to incorporate both the modern societal structures of the former colonial oppressor and the traits of a re-constructed traditional culture.²⁰ This kind

¹⁷ The Computer History Museum has put a number of 1970 recordings of the 1403 by Ron Mak online. <<http://www.computerhistory.org/exhibits/highlights/>> They are also running an extensive 1403 restoration project documented at <<http://www.ed-thelen.org/1401Project/1401RestorationPage.html>> Actually there were two ways of making music on the 1401: one was by feeding the 1403 printer with a M.U.S.I.C. programme of punch-cards or magnetic tape programs which would sustain the pitch of the revolving printing chain, causing it to “sing”; and another way was by feeding the processor with programs which would cause RFI (Radio Frequency Interference) that could be tuned in to through a common transistor radio. The latter produces a somewhat clearer sound than the printer method.

¹⁸ See <http://www.ausersmanual.com> for extended Liner Notes of the CD release. It is apparent that the recordings used by Jóhannsson were made with the RFI recording method and not the 1403 printer (see note above) The 30 year old recordings were undertaken by his father Jóhann Gunnarsson - the chief maintenance engineer for the first 1401 imported to Iceland in 1964. Also a musician, Gunnarsson had been involved in recording a “funeral” held for the 1401 on its last day of service in the early 1970’s.

¹⁹ Malm, Krister. *Fyra musikkulturer. Tanzania, Tunisien, Sverige och Trinidad*. Almqvist & Wiksell Förlag AB, Stockholm 1981.

²⁰ Fanon, Frantz. *The wretched of the earth*. Penguin, London 2001 (1966).

of haunting is quite evident in the 1964 speech “Cultural Revolution in Tanzania” held by president Julius K. Nyerere, to celebrate a new “Ministry of National Culture and Youth”:

(...) When we were at school we were taught to sing the songs of the European. How many of us were taught to sing the songs of the Wanyamwezi or the Wahehe? Many of us have learnt to dance the ‘rumba’ or the ‘chachacha’ to ‘rock-en-roll’ and to ‘twist’ and even to dance the ‘waltz’ and the ‘foxtrot’. But how many of us can dance, have even heard of, the Gombe Sugu, the Mangala, the Konge, the Nyang’umumi, Kiduo or Lele Mama? Most of us can play the guitar, the piano, or other European musical instruments. How many can play the African drums? How many can play the Nanga, or the Marimba, the Kilamzi, Ligombo, or the Imangala? (...) So we have set up this New Ministry to help us regain our pride in OUR culture. I want it to seek out the best of the traditions and customs of all our tribes and make them a part of our national culture. (...)
Nyerere, Julius K. quoted in Malm (1981, p 194 note 41)

So while the new statesmen of Tanzania clearly recognised the importance of traditional musical culture to everyday life in their country, they also obviously were trying to recast it into the more modern form of a national canon. Going hand in hand with these ambitions then was the instigation of a national anthem, “Mungu ibariki Afrika” based on a Christian hymn by composer Enoch Sontonga which had also been in use since 1925 as the anthem for the South African ANC party.

In Sweden, there is, not unlike in Tanzania, long history of workers music, stretching back to rural work songs of the peasant society. Traditions which also underwent crucial change during the 19th and 20th centuries. With industrialism, the machines came, and with the machines, a deafening noise among which the songs could not be heard any longer. That is, not until the 1940’s when American inspired muzak records and workers radio stations like “Musik under arbetet” (modelled on the British “Music While You Work”) eventually provided a replacement for the singing.²¹ The 1401 music making could be seen as another step in this history. At a first glance the bureaucrats’ music-making fits nicely into the history of work-place music, as a form of music which has the aim at both relaxing and sustaining production, and as such it is rooted in folk- and popular culture.

However, this music also had the function of presenting the work-place to the public and arose out of the necessity to demonstrate the marvels of the modern machinery in a way that was aesthetically understandable, since the technology in itself would be too opaque for a casual bystander to get a grasp of. But the audience of the performances would be subjected to a lot of noise as well – the 1403 had a limited range of 3 octaves, producing sounds which were as much sounds of the revolving chain as they would be discernible musical information. In a way we might say that there was a radical integration going on here between the sounds of the working machine and work-place music, which is colonising the Tanzanian traditional concept of N’goma as standing for a kind of breakdown of these definitions.

The automated work-music is in this case not any longer presented to the worker by his/her employers, but becomes something which the worker himself produces, as a means to overcome the noise. But a crucial difference factor is that the music is now produced by the machine itself. The worker has to engage with the logic of the machine in order to overcome its seemingly non-aesthetic chaos – to make it represent something. To bring forth music, he cannot feed it with programs for tax collection or civic registration but has to feed it cards

²¹ Ljunggren, Petter. Bohman, Stefan. Karlsson, Henrik. *Arbetets musik – visor, buller, skval*. Carlssons bokförlag, Stockholm, 2002.

which gives a seemingly nonsense output - in effect in the attempt to overcome the machine he has to learn its logic, *how to think like a machine*. As Sartre says of the neurosis of being a native: "The status of 'native' is a nervous condition introduced and maintained by the settler among colonized people *with their consent*."²² In this appropriation process, the worker is not only appropriating the technology to do something else than it was intended to do, but he is also being appropriated by it, or in other words, his culture having already let itself be colonised by the machine, now proceeds to be *de-colonised* by it. But by way of mutual consent, a contract or protocol of agreements and standards, an exchange takes place in this process, and the result is not any longer that the machine is neither simply overcome nor subjected to, it is rather a hybrid creation taking the form of a "functional breakdown", the rehabilitated N'goma. The final irony of course being that this creative colonisation of man and machines should produce a version of the God Bless Africa anthem, itself so haunted by similar colonisation/de-colonisation dialectics.

"Introduce disorder"²³

Some typical applications of the "1401 Data Processing System" is listed in a 1959 IBM "fact sheet": "Payroll, Railroad freight car accounting, Public utility customer accounting, merchandising, accounts receivable for retailers."²⁴ Often referred to as the Model-T Ford of the computer industry, computer historian Paul E. Ceruzzi writes:

It was a utilitarian device but one that users had an irrational affection for. At nearly every university computer center, someone figured out how to program the printer to play the school's fight song by sending appropriate commands to the printer. The quality of the sound was terrible, but the printer was not asked to play Brahms. Someone else might use it to print a crude image of Snoopy as a series of alphabetic characters. In and out of Hollywood, the chattering chain printer, spinning tapes, and flashing lights became symbols of the computer age.²⁵

So, to the list of typical uses of the 1401 system above, we might add items of an altogether different sort: the numerous creative appropriations within public and business administration mentioned here and elsewhere. Compared to the emerging art & engineering culture of the 1960's with famous examples such as EAT, the 1401 examples are artistically rather pale experiments, not even belonging to the category of the early "bad" computer art. In his essay "Between a Bach and a Bard Place: Productive Constraint in Early Computer Arts" Douglas Kahn talks about this usually very low quality of early "computer art", a term he describes as having been initially connected to an engineering culture out of touch with contemporary aesthetics.²⁶ Instead Kahn highlights those few artists of the early 1960's like James Tenney who took on the specific constraint of the new machinery and turned it into an aesthetic in itself. This is not unlike the logics of appropriation with which we normally view the avante-garde, not the least when it comes to sound art. Italian Futurists like Russolo celebrate the sounds of the industrial age as aesthetic events in themselves, John Cage in his instalment for EAT's "9 Evenings" expands the role of the composer to one who "simply facilitates an enterprise"²⁷ consisting of all sounds and materials and in "The Life of the Bush of Ghosts"

²² Sartre, Jean-Paul. Preface to Frantz Fanon's "Wretched of the Earth", 1961. Penguin, London 2001 (1966). Available also: <<http://www.marxists.org/reference/archive/sartre/1961/preface.htm>>

²³ John Cage, "Art & Technology" 1969.

²⁴ "IBM Archives: 1401 Data Processing System" <http://www-03.ibm.com/ibm/history/exhibits/mainframe/mainframe_PP1401.html> (07-06-12)

²⁵ P. 76-77 Ceruzzi, Paul E. *A History of Modern Computing*. 2nd Edition. MIT Press 2003 (1998).

²⁶ Kahn, Douglas. "Between a Bach and a Bard Place: Productive Constraint in Early Computer Arts" in Grau, Oliver *MediaArtHistories*, MIT Press 2007.

Eno/Byrne re-arranges found radio-voices into a sound montage “making the ordinary interesting”.²⁸

With some modifications, the case of the everyday 1401 creative practice considered here do, in spite of its “non-status” as art, share an affinity with Kahn’s idea of the “productive restraint”. But here, it seems like the direction of subversion is opposite. If Jacques Attali states that “In music is born power and its opposition: subversion.”²⁹, the subversion of incidental media art is not avante-gardist but rather everyday, as “ordinary” music and popular images emerging from a culture of noise and incomprehensible visual data. The “productive restraint” lies rather in the unfamiliarity of the early computer technology to its users, its impractical sides, its heaviness and noisiness. Its failure to be a representative medium in the age of television. Just like many media artists, the incidental media art puts its machinery to a use it was never intended to. But even though as we have seen, computation might have been tamed to aesthetic ends, “humans thinking like machines” produce something else as well, an act of communication through a kind of de-colonisation which is not the same as intentional appropriation or subversion. Appropriation in this understanding is an accident produced through a “de-colonization of the mind”³⁰ which, in spite of its incidental origin, has the necessary function of establishing an autonomous position for speaking in otherwise oppressive institutional contexts.

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²⁷ Cage, John. “Art and Technology 1969” originally published in *TECHNE*, Vol. 1, No. 1, April 14 1969, p 11. Reprinted in *Teknologi för livet. Om Experiment in Art and Technology*, Schultz förlag, Paris, 2004.

²⁸ Brian Eno quoted in Toop, David. “My Life in the Bush of Ghosts”, liner notes for re-issue Nonesuch & Virgin records 2006.

²⁹ Attali, Jacques. *Noise: The Political Economy of Music* trans. Brian Massumi. University of Minnesota Press, 1985.

³⁰ wa Thiong’o, Ngugi. *Decolonising the mind: The politics of Language in African Literature*. London: James Currey, 1986.

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