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**NETWORKED MUSIC AND SOUNDART WORKS**


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**1950**
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**1951**
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- **1951 \_\_ Imaginary Landscape IV**, John Cage, (*For 12 radios and 24 players. A conductor arrived and half of them picked up their radios. This piece is for twelve radios each of them played by two people, one musician "tunes" and the other operates volume and tone, following chance-generated notations. The score contains timed changes to the tuning and volume in terms of amounts to turn the knobs. The conductor marked time and seemed a bit superfluous, clearly they could have just used a time piece. But it worked out and there was a wide variety of radio material from football announcing, pop music and lots of static, of a wide variety of textures and densities. Each time there were some great serendipitous captures, meaning that every performance is unrepeatable and unique due to the fact that the choice of frequencies varies according to the time and place of execution. « It is thus possible to make a musical composition the continuity of which is free of individual taste and memory (psychology) and also of the literature and ›traditions‹ of the art. The sounds enter the time-space centered within themselves, unimpeded by the service to any abstraction, their 360 degrees of circumference free for an infinite play of interpenetration. Value judgments are not in the nature of this work as regards either composition, performance, or listening. The idea of relation being absent, anything may happen. A "mistake" is beside the point, for once anything happens it authentically is. »* (John Cage, *Silence*, 1967, Cambridge Mass. S. 59). In fact, "Imaginary Landscape No. 4" represents a fresh start in Cage's work in three respects: it is the first performance of a piece in which he uses the "I Ging", and it is the first use of media information that is not entirely predetermined. The piece is four minutes long, and here, a year to come before his famous silent piece «4'33"» Cage makes two random structures overlap: for the composition he uses incidental components from the Chinese oracle "I Ging" combined with incidental sounds from the radios; sounds that are in the air have to be received on the predetermined frequencies according to the time and location of the production. Thus Cage is realizing one of the first fully "open artworks" using technical media—incidentally, even before Umberto Eco coined this term. Thirdly, «Imaginary Landscape No. 4» also uses silence as a compositional element: Cage says that «almost no sound» was to be heard at the 1951 premiere, and that he was aware of the soundless quality of this piece even while writing it. As with «4'33"», the audience of «Imaginary Landscape No. 4» experienced four minutes of heightened sensitivity in which musical content is replaced by pure listening, though still mediated through the twelve radios used as instruments, allowing the mass media omnipresence of the broadcasting stations to be experienced as aesthetic raw material at the time of performance. In today's terminology, it would be possible to speak of « 4'33"» as an «unplugged» version of the piece for radio.) <http://www.medienkunstnetz.de/works/imaginary-landscape-4/>

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- **1954 \_\_ (?) Early computer music performance at MoMA by the founders of Computer Music Center at Columbia University of New York. The forerunner of the Columbia-Princeton Electronic Music Center was a studio founded in the early 1950s by Columbia University professors Vladimir Ussachevsky and Otto Luening, and Princeton University professors Milton Babbitt and Roger Sessions. Originally concerned with experiments in music composition involving the new technology of reel-to-reel tape, the studio soon branched out into all areas of electronic music research.**

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- **1956 \_\_ Radio Music**, John Cage (*Radio Music, composed in May, 1956, premiered on May 30, 1956 at the Carl Fisher Hall in New York City. Performance by John Cage, pianists Maro Ajemian, David Tudor, Grete Sultan and the four members of the Juilliard String Quartet. An 'all musicians' super group, though the score does not require musical literacy, unlike the other radio work 'Imaginary Landscape nr. 4' (1951), for 12 radios, which is musically notated and requires a conductor. A third work by Cage, requiring radios (5) and one newsreader, is 'Speech' (1955). Radios in Cage's works, just like turntables/ records (cf. Imaginary Landscape nr. 1 (1939), using test records (with constant tones) which some sources give the credit of being the first ever electro acoustic work, but there were earlier examples like Respighi's 'Pini di Roma' (1924), using pre-recorded sounds of birds) are to be heard more as 'objets trouvés' or 'found sounds' rather than sound generating tools (which they were in the hands of 'arbitrary' composers like Pierre Schaeffer (records) or Karlheinz Stockhausen (shortwave*

radio)). The score to *Radio Music* (for 1 to 8 performers) indicates very brief instructions: ...to be played alone or in combination with the other parts. In 4 sections to be programmed by the player with or without silence between the sections, the 4 to take place within a total time-length of 6 minutes. Duration of individual tunings is free. Each tuning to be expressed by maximum amplitude. A \_\_\_\_\_ indicates 'silence' obtained by reducing amplitude approximately to zero. The list of frequencies ranging from 55 to 156 is confusing at first (at least to me), especially when Cage mentions in interviews (cf. *Conversing with Cage* - Richard Kostelanetz ed.) kilocycles. The range between 55 and 155 kHz being the LW band, which in the US (contrary to Europe) has no commercial broadcasting, only 'services' like weather forecasts. But then pictures and people made me aware of the fact that AM radios in the 50's omitted the last 0's on the dial wheel. This placed the Radio Music frequencies in the AM band. [Guy De Bièvre] <http://okno.be/?id=591>

- **1956** \_\_ **This is Tomorrow**, ICA Independent Group ("This Is Tomorrow" was a seminal art exhibition in August 1956 at the Whitechapel Art Gallery, facilitated by the innovative curator Bryan Robertson. "This is Tomorrow" has become an iconic exhibition notable not only for the arrival of the naming of Pop Art but also as a captured moment for the multi-disciplinary merging of the disciplines of art and architecture. This legendary exhibition (June 1956, Whitechapel Art Gallery) was an attempt at a super-juxtaposition, in order to explore a notion of space from multiple approaches: architectural, pop-cultural, social, aesthetical, and perceptual. The core of the exhibition was the ICA Independent Group. It was conceived by architectural critic Theo Crosby, who was the editor of *Architectural Design* magazine, and a member of the ICA. Theo Crosby had attended a congress in Paris in 1954 on the drawing together of fine and applied arts, and later approached about a similar concept to *This Is Tomorrow* by representatives of Groupe Espace in London. *This Is Tomorrow* exhibition included artists, architects, musicians and graphic designers working together in 12 teams, an example of multi-disciplinary collaboration that was still unusual. Each group took as their starting point the human senses and the theme of habitation. The exhibitions most remembered exhibit was the room by Richard Hamilton, John Voelcker and John McHale, with collaboration from Magda and Frank Cordell. It included the Op Art Dazzle panels, collage Space modules, and Pop Art 'readymade' Found art of a Marilyn Monroe poster, the Van Gogh Sunflowers poster, a film advertising billboard of the *Forbidden Planet*, *Robby the Robot*, a Jukebox, the strawberry perfumed carpet, the endless reel of film depicting the Royal Navy Fleet at sea, the large Guinness beer bottles, the Marlon Brando poster image and the 'CinemaScope' collage mural design, and the design of the Pop art collage poster that were all provided by John McHale. Frank Cordell assisted McHale with accessing the film posters such as *Julius Caesar* (1953 film) for the collage murals, the *Forbidden Planet* items, the juke box with an endless selection of popular records, including Frank Cordell's pop hit, and installing the film projector, and installing the Duchamp rotor discs given to McHale by Marcel Duchamp in New York. Frank Cordell also installed the electronic amplifier and microphone enabling the ambient sounds from audience cybernetic feedback; and this was the first example of an artistic "Happening" in Britain. The Senses panel with arrows featuring Tito was a joint collaboration between Hamilton and McHale, and the version reproduced in the catalogue was slightly different in wording to alter the optical perception of viewers. Parts of *This Is Tomorrow* were recreated in 1990 for an exhibition at the Institute of Contemporary Arts. Group One: Theo Crosby, Germano Facetti, William Turnbull, Edward Wright / Group Two: Richard Hamilton, John McHale, John Voelcker / Group Three: J. D. H. Catleugh, James Hull, Leslie Thornton / Group Four: Anthony Jackson, Sarah Johnson, Emilio Scanavino / Group Five: John Ernest, Anthony Hill, Denis Williams / Group Six: Eduardo Paolozzi, Alison and Peter Smithson, Nigel Henderson / Group Seven: Victor Pasmore, Erno Goldfinger, Helen Phillips / Group Eight: James Stirling, Michael Pine (CMHC Ottawa architect), Richard Matthews / Group Nine: Kenneth Martin, Mary Martin and John Weeks / Group Ten: Robert Adams, Frank Newby, Peter Carter, Colin St. John Wilson / Group Eleven: Adrian Heath, John Weeks / Group Twelve: Lawrence Alloway, Geoffrey Holroyd, Toni del Renzio.) [http://www.thisistomorrow2.com/pages\\_gb/1956gb.html](http://www.thisistomorrow2.com/pages_gb/1956gb.html)

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- **1957** \_\_ **Grand Composition**, Pauline Oliveros (After receiving her bachelor's degree in composition in 1957, Pauline conducted the experiment that would change her life completely. She had begun working with electronic means, and the whole field of time and sound became her material, as John Cage predicted for composers in 1937. Sitting in her little apartment on Presidio Avenue one day, Pauline pointed a microphone out an open window and recorded the sound environment until the tape ran off the reel. "What shall I record next?" had been her impetus. While the recorder ran she sat and listened carefully, and discovered upon replaying the tape that she had not heard all of the sounds found there. "I discovered for the first time how selectively I listened and that the microphone discriminated much differently from that which I did." From that moment she became determined to expand her awareness of the entire sound field. To do this, she gave herself a seemingly impossible task: To literally listen to everything all the time. Why? "If nothing else, music in any of its multitudinous manifestations," including the songs of nature, "is a sign of life. Sound is intelligence. If I don't listen I don't learn, I don't expand, I don't change." Through this exercise, which by now has become a life-long process, Pauline began to hear the sound environment as a Grand Composition. The rhythms and relationships that occurred began to enter her work consciously. But her listening assignment proved painful at times. Whenever she found herself not doing it, she realized this caused gaps in the Grand Composition, at least for her. And the artificial environment and its wastes were snuffing out what must have been a world symphony of natural sounds. Anyone can attest to how distasteful industrial noise pollution can be. But her work with electronic music provided a channel for that and allowed her to experiment further with tonal composites, splintering overtones and partials, and what she calls "the delightful ambiguity between pitch and sounds." But doing her assignment soon made it clear that it was possible to give equal attention to all that entered the sound field. This awareness is

very general, open, and non-judgmental, as compared to concentrated attention which is narrow, clear, and selective but limited in capacity. What is amazing is that Pauline discovered she could use both modes at the same time, that listening to everything generally did not distract at all from her ability to concentrate on specific things.) [http://www.o-art.org/history/50s&\\_60s/TapeCenter/Oliveros/INTERVAL86.html](http://www.o-art.org/history/50s&_60s/TapeCenter/Oliveros/INTERVAL86.html)

- **1957** \_\_ In 1957 in Sweden Friedrich Jürgenson bought a tape-recorder to record his own singing and he started to notice at this time some quite strange phenomena; inexplicable fade-ins and fade-outs on the tapes; abstract visions and telepathic messages. Jürgenson understood that these events were produced by his highly developed aural and visual senses caused by his artistic process. « I sat by the table, clearly awake and relaxed. I sensed that soon something was going to happen. Following an inner pleasurable calmness, long sentences in English appeared in my consciousness. I did not perceive these sentences acoustically but they formed themselves as long phonetic sentences and after a closer study I couldn't conceive the words as correct English but in a disfigured almost alphabetical way - completely deformed. I did not hear a voice, a sound nor a whisper. It was all soundless. » Later he also recalled that in the spring of 1959 he « got a message about a Central Investigation Station In Space, from where they conducted profound observations of Mankind » and « My friends spoke about certain electro-magnetic screens or radars, that were frequently transmitted, day and night, in thousands to our three dimensional life levels and like living beings had a mission as mental messengers. Undoubtedly one could see these radars as half-living robots that, remote controlled, had the ability like an oversensitive television or radio to correctly register and transmit all our conscious and unconscious impulses, feelings and thoughts. » Jürgenson knew that these fantastic facts really belonged in a Science Fiction world but he carried on hoping to capture these messages on tape. On June 12, 1959, Jürgenson, and his wife Monica went to visit their country house to enjoy the warm summer. Jürgenson brought his tape-recorder to record the singing of wild birds, especially the chaffinch. Listening to the tape he « heard a noise, vibrating like a storm, where you could only remotely hear the chirping of the birds. My first thought was that maybe some of the tubes had been damaged. In spite of this I switched on the machine again and let the tape roll. Again I heard this peculiar noise and the distant chirping. Then I heard a trumpet solo, a kind of a signal for attention. Stunned, I continued to listen when suddenly a man's voice began to speak in Norwegian. Even though the voice was quite low I could clearly hear and understand the words. The man spoke about 'nightly bird voices' and I perceived a row of piping, splashing and rattling sounds. Suddenly the choir of birds and the vibrating noise stopped. In the next moment the chirping of a chaffinch was heard and you could hear the tits singing at a distance - the machine worked perfectly! ». From this point Jürgenson continued to investigate in these phenomena and at first he thought it was his "friends from outer space" but very soon he began to believe that these voices were "from the other side", or the 'Voices of the Dead'. At this point Jürgenson abandoned painting for his audio recordings and in 1964 he published 'The Voices From Space' (Rösterna Från Rymden, Saxon & Lindström Förlag, Stockholm). At first Jürgenson only used a microphone and a tape recorder. He simply set up the microphone, set the recorder to 'record' and spoke clearly into the room, leaving space for voices to respond. This was a bit tricky for Jürgenson since he always had to play back the tape, sometimes at a lower speed, to hear the voices. These voices spoke in a combination of various languages such as Swedish, German, Russian, English, Italian - all languages that Jürgenson knew and could speak. He called this new mixture of languages 'polyglot', or 'many tongues'. In spring 1960 one of the voices told him to "use the radio" as a medium and this was the technique he used until his death. He connected a microphone and a radio receiver to the tape recorder and in this way he could have a real-time conversation with his "friends". Usually he set the radio reception in between the frequencies where there's generally a variation of noises. Later he fixed the receiving frequencies to around 1445-1500 kHz (1485.0 kHz is now called the Jürgenson Frequency). <http://www.fargfabriken.se/fjf/life.html>

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- **1958** \_\_ « **Musik im Raum** » (Music in Space), Karlheinz Stockhausen, (in die Reihe, n° 5, 1959) (In lectures such as "Music in Space" from 1958 (Stockhausen Texte 1:152-75) in Darmstadt, he called for new kinds of concert halls to be built, "suited to the requirements of spatial music". His idea was a spherical space which is fitted all around with loudspeakers. In the middle of this spherical space a sound-permeable, transparent platform would be suspended for the listeners. They could hear music composed for such standardized spaces coming from above, from below and from all points of the compass. (Stockhausen Texte 1:153) This was realized from 1968 : For the 1970 World Expo in Osaka in 1970, Germany built the world's first, and so far only, spherical concert hall (a complete sphere). It was based on artistic concepts by Karlheinz Stockhausen and an audio-technical concept from the Electronic Studio at the Technical University in Berlin. The audience sat on a sound-permeable grid just below the centre of the sphere, 50 groups of loudspeakers arranged all around reproduced, fully in three dimensions, electro-acoustic sound compositions that had been specially commissioned or adapted for this unique space. Works by composers including Bernd Alois Zimmermann and Boris Blacher were played from the multi-track tape, along with Bach and Beethoven. In the course of the 180-day exhibition, Stockhausen and a high-calibre, 19-strong ensemble gave live concerts for over a million visitors; «Spiral,» for a soloist and short-wave receiver was played over 1300 times, for example. It was possible to achieve the three-dimensional sound distribution live, using a spherical sensor built in Berlin to feed the 50 sound sources, but a ten-channel rotary mill constructed to Stockhausen's design was deployed more frequently. [Golo Föllmer]) (« Dans Gesang der Jünglinge, j'ai été le premier à réaliser l'insertion à l'intérieur même de la composition de la direction sonore et de la mobilité spatiale des sons, à constituer donc une nouvelle dimension de l'expérience musicale. (...) Un espace sphérique à la surface duquel seraient disposés des haut-parleurs. Au milieu de cet espace sphérique serait suspendue une plate-forme acoustiquement perméable et transparente où les auditeurs prendraient place. » - Contrechamps, n°9, L'Age d'Homme, Paris, 1988, pp. 78-100)

- **1958** \_\_ **Radio Mercur.** (Offshore radio broadcasting did not begin in Denmark. However, the concept of broadcasting popular music programs from international waters directed towards an audience in a country with a state monopoly on radio transmissions came from Radio Mercur, a Danish commercial radio station that started airing its programs on August 2nd, 1958 — now half a century ago. Henrik Nørgaard, author of the book *Pirater i æteren* (2003). From August 2, 1958 until July 31, 1962 a pirate station called Radio Mercur transmitted commercial radio from a ship in the international waters between Denmark and Sweden. It was aimed at youthful listeners. Another pirate, named DCR, or Danmarks Commercielle Radio, was on air from September 15 1961 until January 29 1962 when it combined with Radio Mercur. Eventually, the ship called Cheta II was forced - by the Danish FCC - to stop transmitting. (The law even forbade Danish citizens from recording programs from Radio Mercur!)) [http://www.icce.rug.nl/~soundscapes/VOLUME11/When\\_Mercury\\_got\\_wings.shtml](http://www.icce.rug.nl/~soundscapes/VOLUME11/When_Mercury_got_wings.shtml)

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**1960**[TOP](#)

- **1960** \_\_ **Motor Vehicle Sundown**, George Brecht (*George Brecht's Motor Vehicle Sundown (Event)* (1960) is a legendary verbal instruction piece scored for any number of motor vehicles arranged outdoors. For each vehicle, 22 auditory and visual events and 22 pauses are written onto randomly shuffled instruction cards. Beside "pause", the events include: Headlights on and off, Parking lights on and off, sound horn, sound siren, sound bell(s), accelerate motor, radio on and off, strike window with knuckles, open or close door (quickly, with moderate speed, slowly), open or close engine hood, operate special equipment (carousels, ladders, fire hoses with truck-contained pumps and water supply), operate special lights (truck-body, safety, signal, warning, signs, displays). At sundown "(relatively dark/open area incident light 2 foot-candles or less)," the performers arrive at the same time, seat themselves in the cars and start their engines at approximately the same time. They follow the instructions, substituting equipment for that which they do not have, and turn off their engines when they are finished.)

- **1960** \_\_ **Public Opinion Descends upon the Demonstrators**, Robert Ashley (A sound controller activated electronic materials in response to audience activities: walking around or leaving the auditorium, speaking, laughing, or whispering. The audience soon caught on and actively participated in the game. Ashley's motivation, as usual, was social commentary: "Rituals in society such as attending church or the opera are rapidly dying," he says. "My interest is the kind of ritual in which audience participation is unpredictable". The largest audience size for Robert Ashley's electronic theater work *Public Opinion Descends Upon The Demonstrators* which at maximum is designed to be experienced by 28,278,466 people.)

- **1960** \_\_ **Xanadu**, Ted Nelson (During his first year as a graduate student at Harvard, Nelson began implementing the system which contained the basic outline of what would become *Project Xanadu*: a word processor capable of storing multiple versions, and displaying the differences between these versions. Though he did not complete this implementation, a mockup of the system proved sufficient to inspire interest in others. On top of this basic idea, Nelson wanted to facilitate nonsequential writing, in which the reader could choose his or her own path through an electronic document. He built upon this idea in a paper to the ACM in 1965, calling the new idea "zippered lists". These zippered lists would allow compound documents to be formed from pieces of other documents, a concept named *transclusion*. In 1967, while working for Harcourt, Brace he named his project *Xanadu*, in honour of the poem "Kubla Khan" by Samuel Taylor Coleridge. Ted Nelson published his ideas in his 1974 book *Computer Lib/Dream Machines* and the 1981 *Literary Machines*. In 1972, Cal Daniels completed the first demonstration version of the *Xanadu* software on a computer Nelson had rented for the purpose, though Nelson soon ran out of money. In 1974, with the advent of computer networking, Nelson refined his thoughts about *Xanadu* into a centralised source of information, calling it a "docuverse". In 1998, Nelson released the source code to *Xanadu* as *Project Udanax*, in the hope that the techniques and algorithms used could help to overturn some software patents. In 2007, *Project Xanadu* released *XanaduSpace 1.0.*) <http://xanarama.net> <http://xanadu.com> <http://xanadu.com.au> <http://www.udanax.com> <http://xanadu.meetup.com>

- **1960** \_\_ **GRAV - Groupe de Recherche d'Art Visuel** (Group for Visual Art Research) (In Paris, Argentine artists Julio Le Parc and Horacio García Rossi, together with Francisco Sobrino, François Molleret, Joël Stein and Yvaral founded the GRAV (Group for Visual Art Research) in 1960. They were paralleled by other Argentine artists living in Paris, such as Gregorio Vardanega, Martha Boto and Hugo Demarco, whose works also became reference points in the history of kinetic art. GRAV was formed around the idea of abolishing the conception of the artist as individual genius. Adopting multi-production to replace the single, individual work of art, their interest was in collective, anonymous creation. They organized numerous public events that they called *Labyrinths*. For them the context of exhibition and the place of the audience were fundamental, and this conviction led them to experiment with optical and kinetic effects aimed at the "human eye," while they denounced the elitism of traditional art that appealed to the "cultivated eye". Through the use of technology, GRAV sought a way to erode the limits between art and life. *MANIFESTO* (1966) : "We are particularly interested in the proliferation of works which permits varied situations, whether they engender a strong visual excitement, or demand a move on the part of the spectator, or contain in themselves a principle of transformation, or whether they call for active participation from the