

Albert's Ark: A Glance into the Fourth Dimension

A case study for the Inside Installations project by Institute Collection Netherlands (ICN) and the Netherlands Institute for Media art (NIM).



The artwork and its principles.

Albert Einstein and his theory of relativity have long since been an inspiration for Dutch artist Bill Spinhoven (Velzen, 1956). Einstein's theory explains how space and time have an impact on each other; how "nowhere in space, time is identical – although the differences are only perceptible at a cosmic scale".¹ Spinhoven's fascination stems from his education from 1978 to 1981 at the Technical University in Enschede (NL) and has since then become the centre point of his artistic endeavours. He wanted to visualize the 'space-time' distortion (to use Star Trek terminology) to give viewers a sense of the meaning of Einstein's conclusions. Spinhoven developed a device he called the 'Time Stretcher' which was able to do this. He explained his motives in a short essay:

Time stretching is based on the fact that our environment has a four-dimensional character: the three spatial ones and time as a fourth. Our image of our environment is formed through interpretation of sensorial observations. We create for ourselves an abstract model of what we perceive to be reality.²

He concludes that these abstract models (the sciences and the arts in all their diversity) have always formed our image of the surrounding world, but that they themselves have been changing over time as well. We don't look at the stars as pinpricks in the drapery of heaven anymore but rather as sphere-shaped bodies millions of light years away.

¹ Maurice Nio, "Albert's Ark, a Glance into the Fourth Dimension", in: R. Coelho (ed.) e.a., exh. cat *Imago, fin de siècle in dutch contemporary art*, The Hague/Amsterdam (Rijksdienst Beeldende Kunst/Mediamatic) 1990, p. 74. (cat. also published as special edition of *Mediamatic Magazine*, vol 5, #1&2 Summer 1990)

² Bill Spinhoven, *Bijlage 1: Time Stretching* [typescript], Montevideo archives. Transl. from Dutch.

It was, for example, Einstein's general theory of relativity that taught us that time is not a linear, unchangeable quantity and that as a result changes in the linearity of time also mean changes in the shape of moving objects. It is on this principle that 'Time Stretching' is based.³

Formal Aspects

At the start of the 1990s Albert's Ark was described as a cross between a large sundial made of stone and a modern 'video clock' of which the monitor does not show the time but the impact of time on space. It takes the form of a large round sundial (about 270cm in diameter and about 50cm high), complete with a slanted pole (which rises up above the work to about 200cm high). The front of the ark is marked by three pie shaped segments that have been lifted up at the front to give space to a built-in TV monitor. The monitor functions within a closed circuit with a camera, which is housed in the upper end of the slanted pole. Also a mirror is attached to the end of the pole. Through this mirror the camera has a view of everything that passes in front of the sundial. In the original work (1990) the Time Stretcher hardware was placed inside the sundial, also within the closed circuit of the camera and monitor.

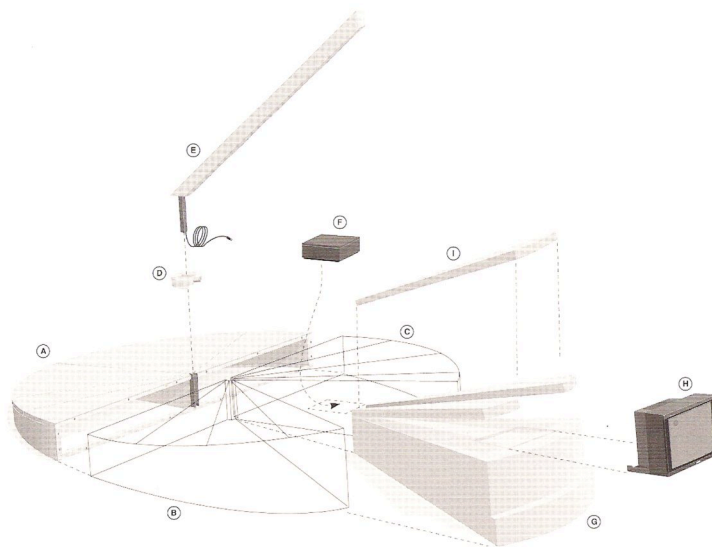


Fig. 2. **Overzicht van de gehele constructie.**
Volgorde van montage volgens de letters A t/m I. Alvorens segment G aan te schuiven, dienen eerst balk met camera E en de monitor H op kist F (in segment C) te worden aangesloten (zie ook fig. 4).

The sundial has been constructed of plywood in 4 parts: the back half, 2 closed pie shaped parts about 1/6th of the total diameter and the opened up part (the final 1/6th part) which houses the monitor. The sundial has been roughed up to imitate a stone or concrete surface and painted the grey of concrete. Because of its size and outward appearance the Ark looks very heavy, effectively mimicking solid stone. Albert's Ark is an example of a clearly definable period in Spinhoven's way of working. The

work combines a technological component, a conceptual approach (towards Einstein's theory of relativity in this case) with a, in a sense, classical sculptural 'suit'. This sculptural element adds in many ways to the presence of the work and its possible meanings. It gives the artwork a sense of connection with the long history of art and specifically sculpture. In later works Spinhoven concentrates more on the interactivity of the work with its viewer through technology, while shedding the sculptural skin.

Role of the Spectator

The viewer plays an integral part in Spinhoven's works and Albert's Ark is no different. When the approaching spectator walks into the zone registered by the camera, the Time Stretcher starts to work on the distortion of the recorded spectator movements, displaying the result on the monitor. The essence of the Time Stretcher is rather simple: it slows down the recorded image in the bottom third of the screen and speeds it up in the upper third. The middle part is left untouched. The result is that the movement of the spectator is translated into sinuous movements of him or her on the monitor: the head has already passed out of the image at the top right as the feet are lagging behind at the bottom left. Dropping objects in front of the camera is the ultimate way of visualizing Einstein's theory. Einstein calculated that objects moving in excess of the speed of light will travel back in time. In Albert's Ark this is visible in a way: due to the speed with which the object falls in front of the camera, the Time Stretcher will make the object fall upwards on the monitor.



By interacting with Albert's Ark the viewer becomes part of the work and finishes the artwork.

Albert's Ark was created for the occasion of the exhibition *IMAGO, Fin de siècle in Dutch contemporary art*. This travelling exhibition represented the current state of media art in The Netherlands of the early 1990's and included mainly commissioned works of art. Altogether Imago,

curated and produced by the NIM and the Netherlands Office of Fine Arts (a predecessor of ICN), travelled for four years after which all works were acquired by the latter organisation.

Why was this work chosen as a Case Study?

The work is representative of the 'state of the art' technological advancement of the 1980's and beginning of the 1990's, which is at this moment in time (2007) rapidly becoming obsolete. This was the first version in color of the Time Stretcher, hand built by the artist from existing computer components. The artist developed the idea, technique and different versions and applications further during the last 15 years. The original Time Stretcher hardware of the installation were missing, which meant that Albert's Ark was interesting as a case study because it could shed light on the pros and cons of emulating the original artwork.

Immediate goal of the project was to re-install Albert's Ark to working condition on the 8th and 9th of March 2007. The result of this re-installation is not identical to the original because of aforementioned missing parts and the choice to emulate instead of reconstructing these. In essence a revised 2007 edition of the original 1990 artwork came into being.

What was the focus of your research for this Case Study?

The main focus was to establish what was important for the preservation of the artwork and to explore if emulation is a good way of preserving of doing this. In general the case also explores if emulation based on documentation is a good way of preserving an artwork when a comparison with the original is not possible. As a result of this, the case study served to explore (and prove) the importance of documentation for useful preservation of artworks.

Conservation of the sculptural elements was in a sense less of a concern, although this case study provided an excellent opportunity to record extra information on this subject, thereby better documenting the work for future reference. During the case study an inventory was made of the documentation present at the NIM and ICN. A partially completed registration model for multi-medial installations was completed and an instruction manual for future installation was created. Finally an assessment was made of the current condition of the work (especially the sundial sculpture).

In order to better understand what is important to preserve this installation and to make future presentations of the artwork possible, the artist was asked to work together with the preservation team to write an emulation proposal and to re-install the work to working condition. The artist gave a public presentation of his research and emulation proposal while the work was re-installed. After the presentation of the emulated version of Albert's Ark and Revolution (one of the other case study by a similar team) a selected part of the audience was asked to give their opinion on several emulation statements and questions. The entire process, including the presentation, was documented in text, video and images for future reference.

What were the preservation issues?

Main issues centred on the missing 'Time Stretcher' device and the rapidly aging consumer electronics used in the artwork, namely the Sony tube monitor and Hitachi CCD camera. The central question that arose was 'What to do with specific equipment that has become outdated, including its spare and replacement parts?' Additionally the importance of the mirror came to the fore.

As explained earlier, a major part of the experience of this installation is dependent upon the viewer's participation. This participation can only be achieved if the installation is fully functional. Since the original 'Time Stretcher' device was missing, full functionality was only possible through emulation. Emulation was therefore considered more important than the authenticity and historicity of the apparatus. Important in this respect was the question of which requirements the emulation must adhere to, both in relation to the original state of the artwork and its (future) preservation.

Preserving hard-and software

Since the original camera, computer and computer program were missing documentation became extremely important. The original blueprints were not available, the artist archive contained blueprints of a slightly older (black and white) version that gave an indication of parts used and more important of the effects this had on the output of the original apparatus. Video documentation of previous presentations together with the knowledge (and memory) of the artist and technicians were needed to determine the used camera and monitor type.

Camera

It was determined the original Albert's Ark made use of a Sony CCD (CMOS) camera. The camera type was deemed especially important by the artist, as its technical limitations were an important factor in the quality of the images shown on the monitor. The original camera was missing, but a similar (Hitachi CMOS) camera was found in the NIM depot. By comparing the video documentation and the current camera images the artist was able to reconstruct a near original image quality. If a similar camera had not been found a major problem would have arisen. The artist and the technicians involved were able to determine what the original image quality was like, but emulating this through software would have been very difficult. This is due to the fact that there is a lack of available research and knowledge on how to describe the image quality in an objective way for software reconstruction. There are no (open source or other) programs on the market able to do this.

Monitor

The Sony Trinitron PVM 2130Q monitor, the type used in the original Alberts Ark, is 17 years old and rapidly becoming obsolete. Nowadays, tube monitors are rapidly being replaced by LCD/TFT flat screens. Visually and technically Albert's Ark depends on the size and type of the 'old fashioned' tube monitor and the Sony PVM specifications. This poses a future problem. Technically the Time Stretcher originally made use of a camera's or monitor's refresh rate and number of lines out of which the image was built up. Visually Albert's Ark depends greatly on the size and presence of a tube monitor and the Sony PVM especially. The front piece of the sundial, with the lifted panes has been designed specifically to house the Sony PVM (with its iron framing on the back removed). Placing a flat screen monitor into this space is possible but dramatically changes the look of the work as a whole and the look of the images as well. A special casing with the outward measurements would ideally have to be created, to maintain the angle of the sundial pane resting on the monitor. Because the original monitor was at hand and in working order in this case study, the problem did not need to be addressed, but it will become pressing as soon as the Sony PVM (or similar monitor) starts disappearing in the next decade. The artist supposed it would be possible, as a future solution, to cut off the front of the glass tube, preserving the typical slightly curved front of the tube, and projecting images on it from behind (with a beamer for instance).

Time Stretcher

The original time stretcher was hardware based. Emulating its effects to achieve a similar look is nowadays much easier with software. It was therefore decided that the reconstruction would not involve rebuilding the original hardware, but instead focus on emulation of its effects through software. To avoid future obsolescence open source software was used when possible. Given time and budget restrictions the capture software (which 'captures' video image sent from the camera and makes it readable for the computer) and the computer platform itself were based on Microsoft Windows and Visual C#. Ideally an open source platform such as Linux would have been used, as its source code is freely available, where Windows' source code is not. Linux is therefore better suited to conservational ends, because the platform can be recreated in the years to come (at less cost), even after it has become obsolete.

The PC used for the Time Stretcher emulation had the following characteristics:

- *A 2 GHz processor (minimum)*
- *1 GB of internal memory (minimum)*
- *Composite or S-Video PAL output for a CRT monitor*
- *Graphics card which supports Shader 3.0 technology*
- *Video card capable of recording.*
- *PC running Microsoft Windows XP SP2*

The artist based his emulation on Microsoft Visual C# (Visual Studio .NET), Nvidia Composer (for developing the shader) and The Imaging Source IC Imaging Control (Direct Show wrapper) for capturing the video image sent by the CMOS camera to the computer. This way he was able to create an emulation running on a Windows XP PC, with the Sony PVM monitor acting as a second screen, showing only the distorted image. Because the missing Sony camera was replaced by a similar Hitachi one, no major work had to be done on emulating the image quality of the end product. Fine tuning was done with filters provided by NVidia Composer.

The artist also introduced a 'help kit': an error logger and added service/maintenance logbook built in to the video player used to emulate the Time Stretcher. These tools make keeping records of the state of the artwork easier and are able to function in the background, invisible to the viewer.

The case study gave the artist the idea to create an open source software application that would potentially be able to emulate any given camera, thus creating a possible tool for conservation of similar video installations. An application of this sort would preferably be written in Pure Data or Mono, because both languages are open source themselves as well as working on an open source platform. This software would provide a suitable set of characteristics to describe any kind of camera and the possibility to add filters based on specific camera characteristics. To achieve this however, fundamental research into the creation of proper models for the describing camera characteristics will still have to be done.

The Mirror

The original mirror used to give the camera its view of the space in front of Albert's Ark was missing. The artist had a reserve mirror holder in his possession, but a new mirror had to be made. The mirror and its holder play a small but important part in the correct functioning of Albert's Ark. The mirror is trapezium shaped and effectively limits the area the camera can see. The holder makes it possible to adjust the exact angle the mirror makes with the camera. This is important because this way the size and place of the spectators on the monitor can be influenced.

Sculpture

The sundial has been constructed of plywood and roughed up to imitate a stone or concrete surface. All small forms of damage are documented. The upper section of the pole was damaged and restored. The pole remains a source of concern, as it is hollow and made of rather thin wood. Restoration of the damaged section was done by an ICN furniture restorer, who re-applied the broken off section by applying a thin linen cloth to the inside of the pole and gluing the section onto that. This however meant that the space into which the camera is placed has become tighter.



Results

Albert's Ark was restored to working order in an updated and revised format. The missing Time Stretcher hardware was replaced by an up-to-date software emulation running on a Windows XP platform, in a way denying its 1980's heritage with regard to the technological advancements of that period. The emulation did achieve a credible level of similarity with the original, and the presence of the original monitor meant that Albert's Ark was at least visually restored to its 'original' working order. The existence of footage with images of the original ark in action was a great help, as was an analysis of the blue prints of a similar if older version of the Time Stretcher. Some compromises had to be made with respect to the ideal strategy of conservation. Firstly the most suitable hard- and software for long term conservation wasn't used due to restrictions in budget and allotted project time. Secondly some less pressing problems were not addressed: the (future) issue regarding the use of tube monitors and the possibilities for creating an open source software application for emulating different kinds of cameras. The reason for this was that the original equipment was still available or easily replaced by a similar product. In the end the re-installation was a credible mix of looking for and constructing an ideal situation and working with the means available to record, repair and re-install the artwork. Some of this work was, due to the compromises, necessarily useful only for the short to midterm conservation, but the assembled documentation and new insights should prove helpful in the more long-term future as well.



What were the most interesting things that emerged from this case study?

- Now is the time to preserve computer-based installations from the 1980s.
- Tube monitors are still an unsolved preservation problem.
- What is the lifespan of computer based installations?
- Since verification with the original was not possible, documentation and similar source code was the source for the emulation of the Time Stretcher.
- Weighing the authenticity of the work and the historicity of the apparatus versus functionality of the installation.
- The problem of describing video image quality.
- 'Is this reconstruction retro kitsch?' one of the presentation attendants asked.
- The artist suggested to include a modular instruction manual in the installation.

Were there areas of further research or questions left unresolved in this case study?

- Storage and maintenance of hard- and software, be it computers, operating systems or monitors.
- Description/notation models of image qualities.
- Emulation of software and platforms.

Exhibition History of Albert's Ark

Albert's Ark was made especially for the travelling exhibition *Imago: fin de siècle in Dutch contemporary art*, which toured the world between 1990 and 1993 and visited the following locations:

- KunstRAI 6 (Amsterdam, Netherlands), 30/5 to 4/6 1990
- XI Video Art Festival de Locarno / Lago Maggiore (Locarno, Switzerland), 29/8 to 20/9 1990
- Hara Museum ARC (Gunma, Japan) 16/4 to ?? 1991
- Kulturni Dom (Bratislava, Slovakia), 30/5 to 13/6 1991
- Mucsarnok – Palace of Exhibitions (Budapest Hungary), 12/8 to 8/9 1991
- Palau de la Virreina (Barcelona Spain), 9/10 to 15/12 1991
- Edificio da Alfadengra do Porto (Oporto, Portugal), 7/2 to 29/2 1992
- World Expo 92 (Arts Pavillion, Sevilla, Spain), 20/4 to 11/5 1992
- Taipei Fine Arts Museum (Taipei Taiwan), 14/8 to 17/10 1993

Other Exhibitions:

- ‘Herinstallatie Albert’s Ark’, *Netherlands Institute for Media art* (Amsterdam), 9/3 2007

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