Appendix 3 Technology

The Van Gogh TV staff developed a number of devices and technologies for *Piazza virtuale*, but also for the group's other projects. For *Piazza virtuale*, the control of programme elements via telephones using the multi-frequency method, which was new for this purpose at the time, was certainly the most important innovation. This was only possible because virtually all picture, video and sound elements were stored digitally on hard disks – at a time when German television was still working almost exclusively with analogue signals on magnetic tapes. At *Piazza virtuale*, on the other hand, every show was a multimedia application.

The previous Van Gogh TV project *Hotel Pompino* (1990) was already technically extraordinarily innovative and was broadcast from one of the first virtual studios in Europe, which the technicians of Van Gogh TV had developed for the most part with then commercially available consumer equipment, not with expensive professional studio technology. Another innovation was the integration of a computer chat in programmes like *Coffeehouse*, which had also been used in *Hotel Pompino* and in its predecessor project *RePublic TV* (1989).

Apart from the television broadcast on 3sat, Van Gogh TV broadcast *Piazza virtuale* every evening for three hours via the Olympus satellite. This programme could only be seen by people the group called "Schüsselschwenker" (dish slewers) – people who specifically searched the range of international television satellites using their private satellite dishes and came across the nightly broadcast of the show by chance. These viewers were among the show's most loyal followers. Not only did they call in regularly, but they also contacted each other and travelled to Kassel to be present during the production of the show.

The broadcasting of programmes from the Piazzettas in other cities using the slow-scan TV method and via ISDN was also a method that was not used in traditional television but *Piazza virtuale* could not have taken place

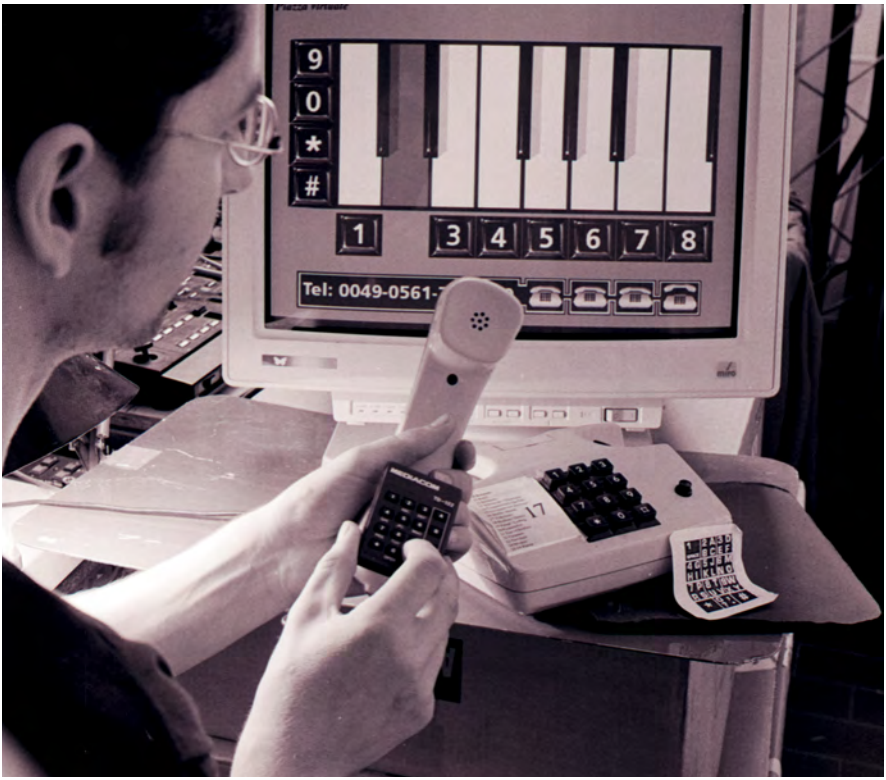
in the planned form without this technology. The so-called access points allowed people in Kassel to participate in the broadcasts.

New technologies were also created for other Van Gogh TV projects. For a telephone chat world, the necessary programmes were written by the group around 1990. The company Ponton European Media Lab in Hanover, which developed out of Van Gogh TV, created a video card called AVIS in 1994. For the project *Service area i.a.*, which took place at Ars Electronica in 1994 and was again broadcast on 3sat, Ponton developed a 3D computer communication environment in which users could enter a virtual space on the internet by means of avatars. The most important of these methods will be explained in greater detail below.

A3.1 Computer-controlled automated programming

One of the technical aims of *Piazza virtuale* was that the show should run automatically and without the intervention of the producers. Each broadcast show was a separate computer program that had to be loaded at the beginning – hence there is a sequence before each new segment in which the audience was asked to wait: "Our computers are loading now." Since the group worked for the most part with commercially available computers, the interaction of the various computers from different manufacturers, which generated different image elements and sounds and into which live video images were also superimposed depending on the show, required specific software developments. These self-written programs, but also the software of the computers, occasionally crashed during the broadcast, which led to failures with boot screens or blackouts.

The task of the staff was to ensure smooth technical running and to make sure that the callers did not use the channel for extremist political statements or other undesirable messages. In other programmes, the dialogue was often also moderated or animated by the Van Gogh TV staff, even though this contradicted the concept of having the audience create all of the content of the show by themselves.



Ponton staffer Christian Wolff uses a beeper to control an early music program
Photo. altschaffel.com

Composer Julian Boyd in the music studio in Kassel
Photo. altschaffel.com

A3.2 Touch-tone control

One of the most important innovations in *Piazza virtuale* was the idea of controlling programme elements using the telephone keypad. This became possible because touch-tone or multi-frequency dialling was introduced in analogue telephony in Germany from the beginning of the 1990s. With multi-frequency dialling, the keystroke signals of a telephone are converted into audio frequencies that could be further processed by computers. The idea came to Benjamin Heidersberger as early as 1990, as excerpts from his sketchbook show. Together with the staff of Van Gogh TV, he developed a telephone interface with his own software that controlled different program elements.

The first controllable module was the game Tic Tac Toe developed by Rainer Koloc, but it was not included in Piazza virtuale. In Atelier, the audience could use a simple drawing program to paint together, and in Rap 'em High (Disco Fever) and Interactive Classic Orchestra they could trigger samples to make music together. The robot camera in the studio was also controlled using the telephone keyboard. In the segment Sarah and Daniel, short video clips were triggered with the help of the telephone keypad, in tazetta you could navigate through news from the newspaper taz using the telephone keypad, and voice messages could be recorded in Record Stack.

This method of controlling events on television can ultimately be traced back to the 1960s German TV show *Der Goldene Schuss* (The Golden Shot), in which a caller could aim an air rifle at a target, a concept that was used to play computer games in the show *Telespiele* (Telegames) with host Thomas Gottschalk in the late 1970s. At the time when *Piazza virtuale* was on air it was even possible to control virtual characters on the TV shows *ZDF-Glückstelefon* and *Superball* (Sat1), even if only by spoken commands. Interaction possibilities were also offered by shows in which the audience could take part in the decision-making process via TED, and by Teletext, in which you could navigate through text panels by remote control. But it was not until *Piazza virtuale* that the telephone became an input medium for programme sequences on the monitor. This principle was used shortly afterwards on the *Hugo Show* (from 1994) on Kabelkanal, where you could control a character in a video game via the telephone.

A3.3 Slow-scan TV and ISDN videophones

Most of the Piazzettas sent their shows to Kassel by videophone. This circumvented the costly satellite transmission that traditional television used for international live broadcasts – a clever trick that was made possible by the fact that ISDN, which was new at the time, allowed large amounts of digital data to be transmitted. Piazzettas that did not have access to ISDN connections used videophones which could send individual images over analogue telephone lines using the slow-scan TV process.

Slow-scan TV signals can also be broadcast via shortwave frequencies and were originally used during space missions in the 1960s and 1970s to send images from space to Earth. As early as the late 1970s, artists such as Bill Bartlett, Sharon Grace, Carl Loeffler, Liza Bear, Robin Winters, Paul Wong and Robert Adrian X worked with this low-tech medium. For the artists, it was a substitute for access to professional video transmission technologies; its aesthetics, especially the slow, line-by-line construction of the individual images, were readily addressed in their artistic experiments with the medium.

However, it was already possible at that time for videophones to "stream" moving pictures when they were connected to the ISDN network. This was done, for example, by Piazzetta Hamburg and Piazzetta Göttingen. Piazzettas Cologne and Zurich even had an ISDN connection installed specifically to be able to use these videophones. For slow-scan transmission, Van Gogh TV used a newly launched device. The Panasonic WG-R2 picture telephone was not yet available in Europe and seems to have been on the market only briefly. American curator Kathy Rae Huffman brought about a dozen sets from the USA to Kassel, which were lent to the various Piazzettas. This loan was acknowledged with loan slips; at the end of the project, the devices had to be returned. According to a list of equipment for the insurance company, the device cost DM550.

Those who connected the devices to an analogue telephone network could transmit individual images. The technology was similar to slow-scan TV except for some minor technical details. Slow-scan TV (SSTV) can transmit several black-and-white pictures in one minute. Similar to the fax technology, the images were decoded into frequency pulses, which were encoded again as an image line by line by the receiving device. The Panasonic WG-R2 videophone was used, for example, for the broadcasts of the Piazzettas in Riga, Prague and Ljubliana.

Slow-scan TV signals can also be broadcast via shortwave and were originally used during space missions in the 1960s and 1970s to send images from space and the lunar surface to Earth. As early as the late 1970s, artists such as Bill Bartlett, Sharon Grace, Carl Loeffler, Liza Bear, Robin Winters, Paul Wong and Robert Adrian X worked with this low-tech medium. For the artists, this was a substitute for access to professional video transmission technologies; its aesthetics, especially the slow, line-by-line construction of the individual images, were readily addressed in their artistic experiments with the medium.

With other videophones from that time, however, it was already possible to "stream" moving pictures when they were connected to the ISDN network. This was done, for example, by Piazzetta Hamburg and Piazzetta Göttingen. Piazzetta Cologne and Piazzetta Zurich even had an ISDN connection installed specifically to be able to use these videophones.

A3.4 Transmission via satellite

In addition to the daily broadcast by the public service channel 3sat, Van Gogh TV broadcast a show every night from 9 p.m. to midnight on the Olympus television and communications satellite. This could only be received by people with a satellite dish who lived in the coverage area, which included large parts of Europe.

Olympus was an experimental television and communications satellite of the European Space Agency (ESA) designed to test new applications such as teleconferencing, high-definition television and data transmission. Olympus, which had been transported into space by the Ariane launcher in 1989, initially carried out its experiments successfully, but was soon plagued by technical defects. In January 1991, there were problems with one of the two solar generators. In May 1991, ESA lost control of the satellite, but was able to save it and it resumed service on 13 August 1991. In August 1993, contact was lost again, possibly because a meteor shower had damaged the satellite. When contact was restored, it was manoeuvred into a graveyard orbit and switched off. The satellite use was sponsored by ESA; Telekom had provided Van Gogh TV with a six-metre satellite dish as an uplink.

A3.5 Computer chat on television

Before the internet became accessible to larger user groups in the mid-1990s, mailboxes were a method of connecting with others using a computer. To do this, you dialled into mailbox computers, which were usually operated by private individuals, from your own PC using a modem via the telephone network and could then upload and download data via remote data transmission (RDT), exchange emails or chat with the other users of the mailbox.

Computer chat had made its debut on Van Gogh TV's *RePublic TV* (1989) and was also used on *Ballroom TV* (1991). At *Piazza virtuale*, chat was one of the methods to participate in the show. For this purpose, they had installed their own mailbox in Kassel, which also ran outside broadcasting hours. Users chatted during *Coffeehouse* and other shows in a chat window that could be seen in the lower part of the screen. Some users were regularly seen in the chat; one particularly regular participant was a "Bootsy". However, since users could choose their own online pseudonym, it is also possible that the name "Bootsy" represented several users. It would then be a predecessor of the multiple avatars, such as at QAnon.

A3.6 Fax on television

One of the ways to get involved in the *Piazza virtuale* programme was to send faxes to a telephone number, which were then received by a NeXT computer at *Coffeehouse* and displayed in a window on the screen. This option was often used by viewers to make contact. Many simply sent their own fax numbers and asked for faxes. Others sent their own pictures, caricatures and photo montages. Some of the faxes would be called "spam" today – i.e. unsolicited advertising for companies. The technology was also used for a political campaign. Fans of the GDR youth station DT-64, which at the time was threatened with losing its frequency, regularly sent faxes to campaign for the preservation of the popular station – an early example of media activism in Germany that anticipated the political online campaigns of groups like Anonymous.

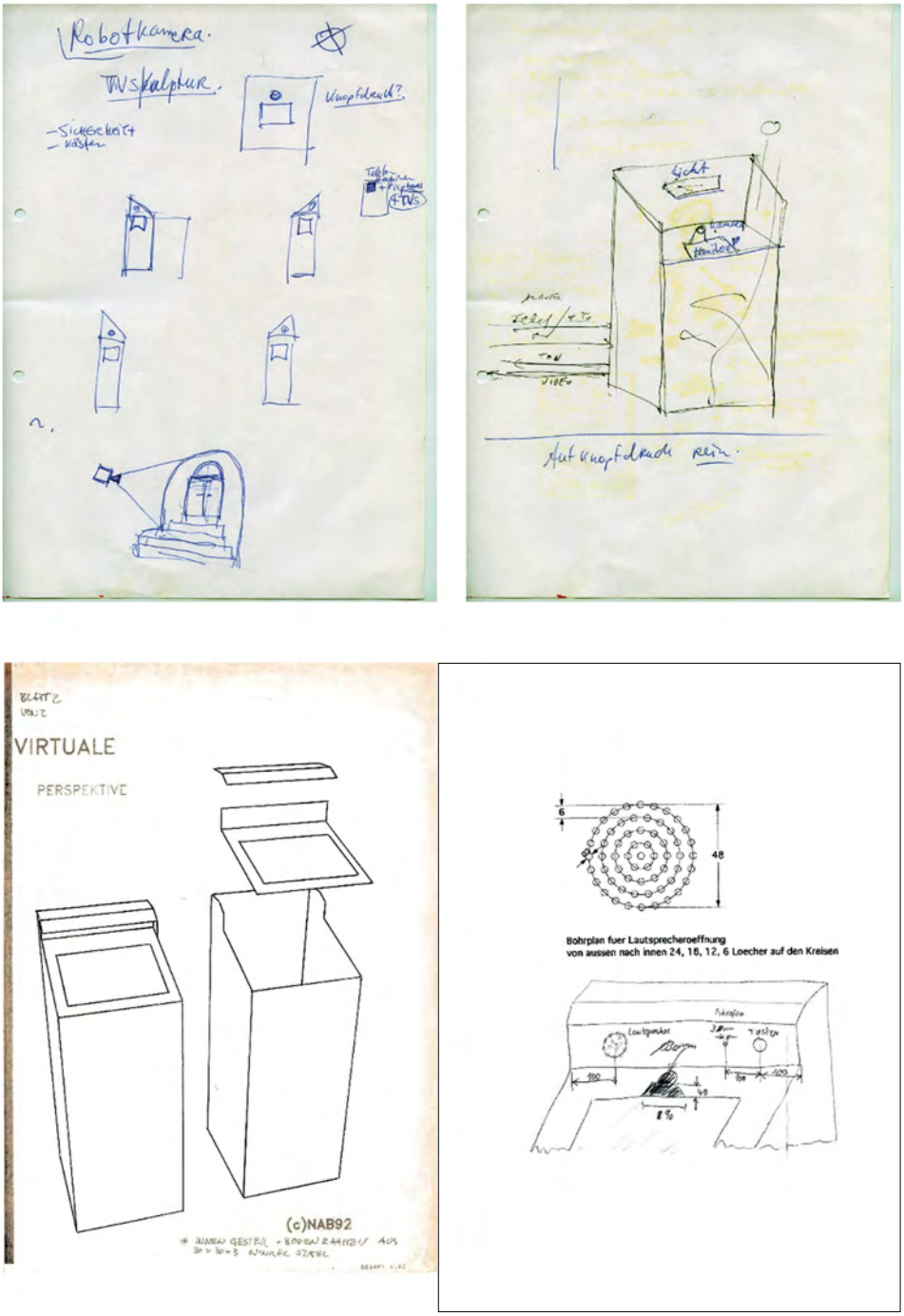
Documenta visitors at the Access Point
Photo: altschaffel.com

A3.7 Access Points

In Kassel, the so-called Access Points – a video camera, a microphone and a monitor built into a console – were located next to the Fridericianum between the studio containers. The design for the construction came from Van Gogh TV staff and was built by a company in Kassel. Passers-by and exhibition visitors could take part in the show, which they could follow simultaneously on the monitor and intervene via microphone and the built-in video camera. The recordings of the Access Points were usually one of several images that could be seen simultaneously on the screen.

A3.8 Computer program for natural language processing

Medialandscape was based on a computer program for natural language processing, which was to enable linguistic interaction between humans and computers. Influenced by Marvin Minsky's book *Society of Mind* (1986), Salvatore Vanasco worked on the broadcast



Two early sketches for the Access Point (top) and the final construction plan

module together with the artist and programmer Wolfgang Werner. Wolfgang Werner developed an object-oriented database that matched keywords and search strings with a selection of media content.

Joseph Weizenbaum's famous computer program *Eliza* had simulated a dialogue between human and computer where the software produced responses using keywords from the sentences that the users typed in. In *Medialandscape*, keywords from the chat in the mailbox and from the calls triggered short sound, video or animation sequences as a reaction. The material for this came mainly from films and TV series; but there were also computer animation sequences designed by Van Gogh TV staff. The idea was to create a dialogue between people and the surrounding "media landscape", which consisted of video sequences, animations, images and sounds – for Vanasco, the "communication became image-generating and space-creating" when certain keywords in the computer chats triggered videos and sounds.