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Transmission Tower: The Third Journey

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Transmission Tower:
The Third Journey

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이기준은 백남준아트센터 테크니션이자 미디어 작품 설치 전문가로 국내외 미술관과 갤러리와 함께 백남준의 작품 설치 및 보존을 수행한 이력을 보유하고 있다. 《트랜스미션: 너에게 닿기를》(2023), 《바로크 백남준》(2022), 《백남준 TV 웨이브》(2020) 등의 다수의 백남준아트센터 전시와 《백남준 비디오 광시곡》(2007), 《경주문화엑스포 백남준 특별전》(2007)의 설치를 담당했으며, 백남준 작가의 오랜 동료 협업자인 이정성 테크니션과 〈메가트론〉(1997), 〈서울 랩소디〉(2001)등의 작품 성능 개선 작업을 함께 수행하였다. 현재 백남준아트센터의 소장품 관리와 백남준 미디어 작품 장기 보존과 대체방안에 관한 연구를 진행하고 있다.

Lee Kijun is a media art technician at Nam June Paik Art Center. Lee has collaborated with various art museums and galleries, specializing in Nam June Paik's works. He engaged in the installation of Paik's artworks in exhibitions including **Nam June Paik Video Rhapsody** (2007) and **Nam June Paik Special Exhibition** at the Gyeonggi Cultural Expo (2007). He has managed the installation of Paik's works at NJP Art Center for various exhibitions including **Transmission** (2023), **Nam June Paik, Super Baroque** (2022), **Nam June Paik TV Wave** (2020) and among others. With Lee Jung Sung, a master technician who had long worked with Paik, he participated in a restoration project regarding **Megatron** (1997) and **Seoul Rhapsody** (2001). He is interested in media art preservation, the preservation of Nam June Paik's works and collection management.

“What is the condition of **Transmission Tower**? Can it be exhibited?” At a meeting in April 2022, the director asked this question out of the blue. After being shown at the 2004 Sydney Festival, Nam June Paik’s **Transmission Tower** had been donated to Nam June Paik Art Center, but none of us had ever actually seen it. The detailed components of **Transmission Tower** had not been thoroughly inspected since its donation, remaining in its original crate storage condition. The fact found from initial inventory work that the artwork did not include the laser devices and MIDI program, essential components for the artwork’s operation, delayed the possibility of installation. However, prompted by the question, we prepared an estimated budget and schedule for inspection and installation, and then dismantled the crates and inventoried the artwork. In early 2023, as we approached the fifteenth anniversary of the opening of NJP Art Center, we assembled a team of specialists and began a hectic schedule to secure funding, inspect the work, and plan its exhibition. On August 31, the new installation of **Transmission Tower** was unveiled to the public, marking the beginning of its third journey.

Transmission Tower is an outdoor installation involving neon lights and lasers, which Nam June Paik first presented in New York in 2002. It consisted of a main tower shaped like a radio transmission tower, 8 meters tall and 4 meters wide, and five mini towers, each 5.5 meters tall and 84 centimeters wide. Thirteen solid neon tubes of red, yellow, blue, and green were attached on all four sides of the main tower, with thirty-two red crackle neon lights attached to the lower part of the tower. Laser projectors were installed on the top of the main tower, for projecting laser beams outward. The top of each mini tower was equipped with reflectors to reflect the lasers from the main tower. In addition to the neon lights and lasers, separate outdoor lights were installed at the bottom of each tower to provide additional lighting.

Since entering the collection of NJP Art Center, **Transmission Tower** had been stored in a total of sixteen crates.

←↓ Fig. 1, 2. Disassembled sections of the main tower
↑ Fig. 3. Disassembled sections of the mini towers

The towers, neon lights, electrical components, and other accessories were categorized and separately crated and numbered. For storage, the main tower was disassembled into three vertical sections (i.e., top, middle, bottom), while each mini tower was broken down into two sections (Figs. 1–3). The middle and lower sections of the main tower consisted of four separate sides that needed to be joined together, accompanied by iron bars and various other components required for their reassembly. A total of eighty-four solid

and crackle neon lights, which had not been used for nearly twenty years, were stored in paper crates. Of these, only one red crackle neon light was found to be defective during initial testing. The neon converters, which allow the neon lights to be dimmed and switched on and off, were accompanied by a surplus of spare parts. Each mini tower was accompanied by the proper number of reflectors. However, as mentioned, the laser equipment and MIDI programs were missing. In addition, since the previous installations of the artwork had taken place in New York and Sydney, a mixture of both 110-volt and 220-volt electrical transformers and other devices were present.

Since there was no instruction manual detailing how to reassemble or install the artwork, we took steps to research the original intentions of the artist. First, archival videos of the 2002 New York exhibition was retrieved from NJP Art Center Video Archives, and the footage was repeatedly reviewed to assess the conditions of the original installation of the artwork. Further information was also gathered through an email exchange with Norman Ballard, a laser specialist who had overseen the on-site installations in both New York in 2002 and Sydney in 2004.

Choosing the location for the installation also involved some trial and error. Several potential locations were considered, with multiple meetings being held to discuss the technical feasibility and overall suitability of each site. After the backyard of NJP Art Center was chosen as the final site, field measurements were taken and simulations were conducted with the space designer in order to determine the precise arrangement of the artwork. During the process of designing the installation, various details were revised several times, including the positioning of the mini towers and the number and arrangement of cars to be installed alongside the towers. After multiple simulations considering the audience experience and the actual sizes of the artwork, along with intensive discussions among the space designer, technician, and curators, the final layout for the artwork was

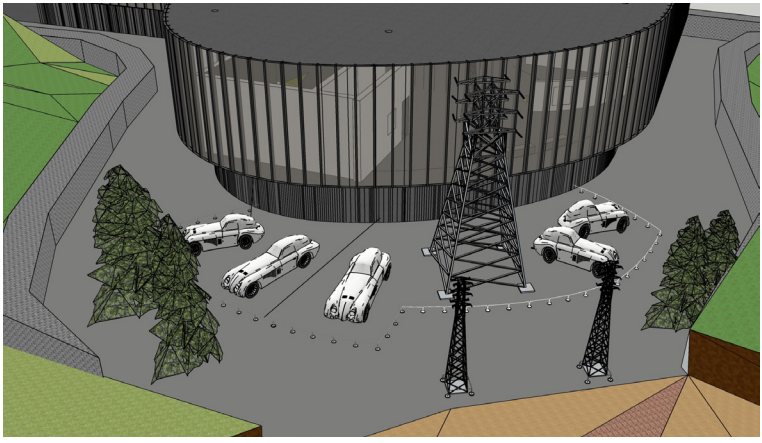


Fig. 4. Final design for outdoor installation of the *Transmission* exhibition (NJP Art Center, 2023)

established (Fig. 4). To facilitate the installation, a professional art handler specializing in large-scale art installations was hired, along with experts in lighting and network installations. Furthermore, since the artwork involved high-voltage neon lights that would be exposed outdoors, an electrical engineering company was also engaged to ensure the safety of visitors, workers, and the artwork itself during installation.

Through this entire process, the most difficult decision involved the lasers and software program. Since the previously used laser equipment and MIDI programs were not present, we needed to recruit an expert with extensive experience in lasers who could select, install, and operate the proper equipment, including programming the software. Given the nature of this project, we also felt it was imperative that this specialist should be an artist who could handle both the technical and aesthetic aspects of the installation. These considerations led us to invite artist Yun Jeho to install, program, and operate the lasers.

The installation of **Transmission Tower** officially got underway when we assembled the four sides of the lower part of the main tower, which had been stored in separate crates (Fig. 5). The four sides were carefully aligned and assembled

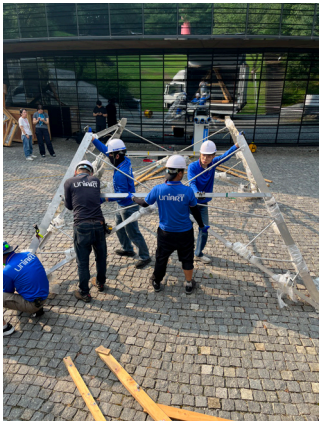


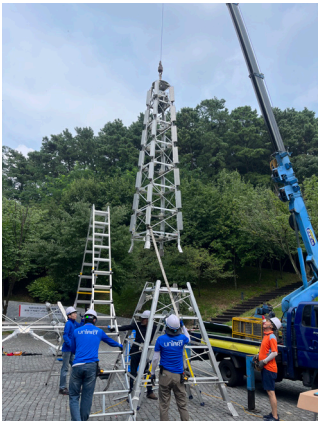
Fig. 5. Assembling the lower frame of the main tower

Fig. 6. Connecting the sides of the lower and middle frames

Fig. 7. Leveling the bases

Fig. 8. Securing the base to the ground

Fig. 9. Affixing the tower to the base



←→ Fig. 10, 11. Assembling the main tower

using steel bars (Fig. 6), and the four feet of the tower were leveled and secured to the ground. Since the tower was being installed on uneven cobblestones, there was much discussion and deliberation about how to secure it to the ground. It was ultimately decided that each foot would rest upon a base consisting of anti-vibration rubber, steel plates, and aluminum plates. First, the anti-vibration rubber mats were laid directly on the ground and leveled with one another, in layers ranging from 2 to 5 centimeters in thickness; these were then covered by the steel plates, followed by the aluminum plates (Fig. 7). To secure these bases, the underlying stones were removed from below the four corners of each base. Holes were then drilled in each corner, and 40-centimeter steel stakes were inserted and driven into the soil (Fig. 8). Once the bases were secured, the tower itself was affixed to the bases with nuts and bolts (Fig. 9). With the lower part of the main tower securely in place, the middle and upper parts, which had been assembled in advance, were lifted into position with a crane, and then aligned and joined to the lower section (Fig. 10). Meanwhile, the two mini towers, the parts of which were divided between two crates, were assembled and secured to the ground by the same method (Fig. 11). This completed the installation of the artwork's three steel towers.

After the towers were in place, electrical and DMX wiring was carried out and the neon lights were installed. Rectangular cases housing the neon converters were attached to the main tower, covering each of the four sides (Fig. 12). Each case contained a converter that was connected to one neon tube, enabling each light to be individually turned on and off and have its brightness adjusted (Fig. 13). In contrast, the crackle neon lights on the lower part of the tower were designed to be connected directly to the power source, with no dimming function. As such, the crackle neon lights could only be switched on or off, and could not be controlled by programming. Next, a separate laser case was manufactured to house the laser projectors that were to be attached to the

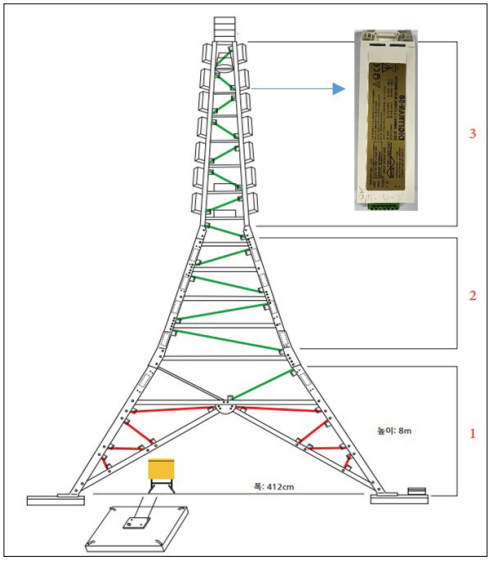


Fig. 12. Side layout of the main tower

Fig. 13. Detail view of a neon converter

top of the tower. After the custom-made steel case was affixed to the top, four laser projectors were installed inside.

The outdoor installation of the artwork began on July 19, 2023. One of the greatest challenges of this process was the extreme heat, with temperatures ranging between 31.4 and 34.2 degrees Celsius during the installation. Prior to the installation, another artwork, Dennis Oppenheim's **Safety Cone**, had to be relocated from the installation site. On July 19 and 20, the frames of the lower part of the towers were removed from the crates and assembled, and the bases were secured to the ground. On July 21, the lower part of the tower was affixed to the bases, and the middle and upper parts were assembled on the ground and then attached to the lower part with a crane. On the same day, the two mini towers were also assembled and erected. Also, the electrical wiring for the neon converters was completed, with the covers for the cases being removed so that the wires could be inserted and connected. On July 22, the neon lights were installed. The neon tubes, categorized by color and size, were loaded onto a bucket truck and raised up to be attached to the sides of

the main tower. Given the extreme fragility of neon tubes, they were carried up in small groups of four or five tubes at a time by two people. The tubes were inserted into flexi-socket boxes attached to the tower and then immediately wired to the converter. The boxes were waterproofed with silicone and rubber, but over the course of twenty years, the materials had deteriorated or been damaged in some areas. Thus, the damaged areas were repaired while the neon lights were being attached. Meanwhile, the crackle neon lights were also carefully secured to the lower part of the tower (Fig. 14). On July 25, the reflectors were attached to the top of the mini towers, completing the first phase of the outdoor installation. After the towers had been installed, five of the thirty-two cars from **32 Cars for the 20th Century** were transported from the storage of Leeum Museum of Art and arranged around the tower. Since the space between the towers was already tight, the cars were very carefully and precisely installed over a period of two days.

As the calendar turned to August, it was time to install the lasers and begin rehearsing the laser light show. Working with artists Yun Jeho and Kim Yooseok, we began the process of installing the network lines and lasers. Since it was very difficult to see the laser beams in the bright summer sunlight, programming and rehearsals could only be carried out after sunset. While this gave us a welcome respite from the intense heat, it exposed us to an unexpected new problem: swarms of mosquitoes from the nearby mountains. To fend off the onslaught of mosquitoes, we hastily acquired insecticides and mosquito repellents and sprayed the surrounding area while working.

Yun Jeho's original program included some spectacular displays, such as shooting lasers into the sky or into distant areas beyond the mountains. However, the airspace above NJP Art Center is part of a regular flight path for airliners. Concerned about potential disruptions to air traffic, we had to alter the laser programming and the angles of the reflectors from the original plans. After the rehearsals, we

Fig. 14. Installing neon tubes

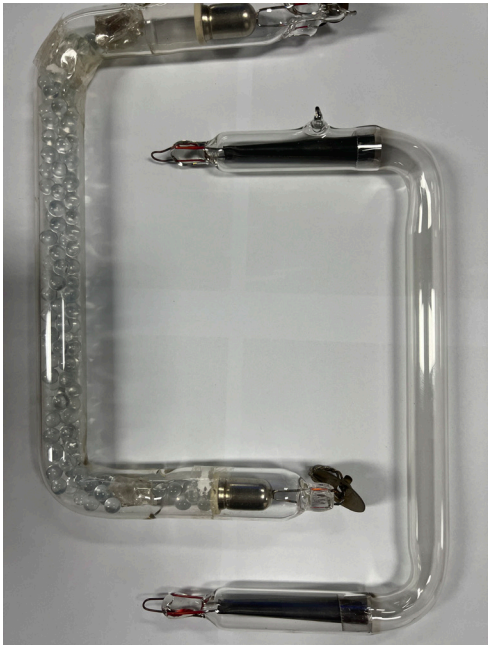


Fig. 15. Crackle neon light (left) and solid neon light (right)

received complaints from a few nearby residents that the lasers were entering apartments in high-rise buildings near NJP Art Center. Thus, we explained to them that the lasers would only operate until 8 p.m. during the exhibition period and asked for their understanding.

After all these twists and turns, the main tower and two mini towers were fully installed and the programming of the lasers, neon lights, and exterior lighting was complete. Thus, **Transmission Tower** was ready meet the audience. The only tasks that remained were to create an installation manual for the artwork and oversee the ongoing maintenance of both the software and hardware. To create the installation manual, a follow-up inventory and list will be prepared, and detailed classifications and drawings will be made for each part.

As for the hardware maintenance, the two most important elements are the neon lights and the lasers. Both the solid neon and crackle neon lights used in the artwork were custom-made according to Nam June Paik's instructions.[1]

In particular, the crackle neon lights, which were made by neon specialist Rudy Stern of New York, contain glass beads that allow for various special effects (Fig. 15). As the name suggests, crackle neon lights simulate the "crackling" flow of electricity, creating a visual effect akin to lightning. One of the crackle neon lights was found to be defective during the pre-installation inspection, and another one stopped functioning properly after installation. In order to replace the two lights, we consulted with neon experts in Korea. Unfortunately, none of the experts in Korea were equipped to manufacture crackle neon lights, which require various special fabrication techniques. As such, the problem of attaining replacement and backup crackle neon lights remains unsolved. In addition, the neon converters are discontinued British products, and finding backups for them is impossible. All of these issues related to maintaining the neon hardware must be considered in future discussions.

Another major task is dealing with the software for the lasers. The software allows all of the light sources (i.e., lasers, neons, and exterior lights) to be synchronized, while also creating the sound for the installation. As mentioned, Norman Ballard was in charge of the lasers for the exhibitions in New York and Sydney, while the laser program for this installation was created by artist Yun Jeho. The installation, programming, and operation of the lasers will be an issue each time this artwork is exhibited. Therefore, to serve as a reference for future installations, detailed diagrams of the laser network were produced, providing all the pertinent information about each component and the channel configurations (Fig. 16).

Finally, I would like to discuss the control devices and programming methods for **Transmission Tower** in order to illustrate how rapidly the technology for media art is advancing, in turn greatly expanding the possibilities for the functionality and visual effects of the artwork. For the

1 Norman Ballard's email (2023)

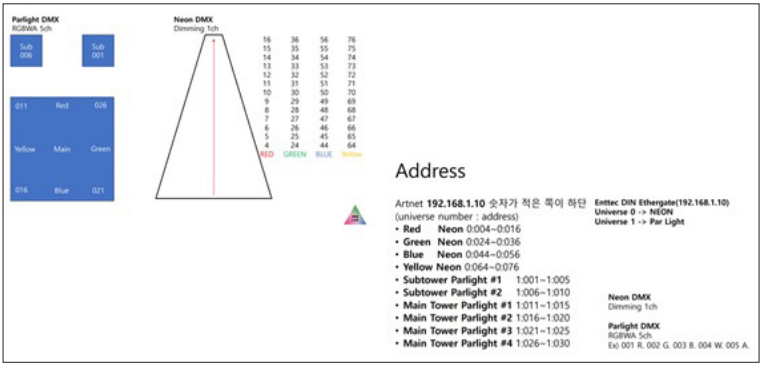


Fig. 16. Network diagram for lasers

New York exhibition in 2002, the neon lights, lasers, and other lights were controlled by a large console, accompanied by a computer mainframe and CRT monitor (Fig. 17). Then in Sydney in 2004, the computer display of the control system was replaced by an LCD monitor. Thus, within only two years, the physical area of the control system was significantly reduced. For the installation in Yongin in 2023, the artwork featured palm-sized neon and laser converters, controlled by a mini PC of the same size. Using a PC connected to a laptop, the artwork was fully programmed to operate automatically according to a set schedule throughout the duration of the exhibition, with no display panel required. Hence, the physical footprint of the controller for the 2023 installation was less than 30cm^3.

In 2002, at Rockefeller Center in New York, the entire electrical and network infrastructure needed to operate **Transmission Tower** was located underground the installation. This was only possible because the infrastructure was already in place, being used to house the electrical equipment used to light the huge Christmas tree at Rockefeller Center. Without this existing equipment in place, it would have been very difficult, if not impossible, to properly operate the laser artwork according to the artist's specifications. Also, for the New York exhibition, the 20-watt laser device was 2 meters long and required 5 gallons of

Fig. 17. Consoles and computers for the 2002 exhibition of *Transmission Tower* in New York (video still from Video Archives of NJP Art Center)

coolant per minute for cooling. In order to transmit from the underground equipment to the laser projector atop the main tower, separate distribution systems for four sets of optic cables had to be manufactured and installed.[2] With all of the equipment being located beneath the installation, concrete bases were manufactured and the towers were secured directly to the ground. In 2004, when the work was installed outdoors in front of the Sydney Opera House, large wooden cases, about the height of an average male, were made and attached to the four lower corners of the main tower. In addition to serving as bases for the tower, these cases also housed the equipment, network lines, and support structures for the artwork. But in 2023, thanks to the remarkable advancement of technology, the controller, PC, and laser devices were drastically reduced in size, becoming almost portable, without significantly affecting the appearance or operation of the artwork. Thus, I look forward to seeing how the advancement of technology will impact the future journeys of **Transmission Tower**.

2 Norman Ballard's email (2023)