

The early art holograms of Carl Fredrik Reuterswärd

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Selwyn Lissack reported on seven holographic art pieces by Salvador Dalí in the [January 2014 issue of *SPIE Professional*](#). The Swedish artist Carl Fredrik Reuterswärd (CFR) is another established artist who was attracted to lasers and holography in the early days. He created several early and unique holographic art pieces.

CFR is better known for his ***Non-Violence*** sculpture, showing a revolver tied in a knot, located outside the United Nations building in New York (Figure. 1). CFR got the idea for this piece after John Lennon was murdered in December 1980 in New York. He and Lennon were friends, and CFR wanted to mark this terrible, sad event with a peace symbol to be recognized around the world. On 20 January 1963, he announced somewhat eccentrically in the *New York Herald Tribune* that he would be closed for holidays during the period 1963–1972 in order to devote all his time completely to art, including lasers and holography (Figure 2). The main project during his holidays was to create the ***KILROY*** artwork.

CFR's first contact with a laser was at Bell Labs in New Jersey. There he met Billy Klüver who demonstrated a laser, and together they made some experiments using laser beams.

In 1963, he made contact with Per-Ove Stopp in Sweden. Stopp's company, SAVEN AB, imported and sold lasers in Sweden. CFR was able to rent a laser from him. Nils-Robert Nilsson at Uppsala University was the first scientist in Sweden who worked with CFR to create laser art. In 1968, CFR used lasers as scene decorations for Ferruccio Busoni's ***Doctor Faust*** at the Opera House in Stockholm.

Towards the end of the 1960s, CFR met Nils Abramson at the Royal Institute of Technology (RIT) in Stockholm. Abramson had started laser and holography research at RIT in 1967. He worked with CFR on some of the very first ***Kilroy*** laser transmission holograms.

In 1972, I started to work with CFR on his holograms. I was one of Abramson's students who, since 1969, worked on hologram-interferometry research projects as well as on display holography. CFR and I cooperated on most of his hologram art pieces during the 1970s. He created early off-axis transmission holograms with me and later also reflection holograms. These holograms were recorded at the holographic laboratories at RIT and at Lasergruppen Holovision AB (LHAB) in Stockholm.

Kilroy was CFR's main work over a period of 10 years. The art piece consists of nine individual pieces: ***The Hand, The Seal, The Coition, The Dog's Bone, The Heart, The Ladder, The Eye, The Seal, and The Stone***. In the installation, a red He-Ne laser beam is illuminating the heart to project a red spot on the heart. Holograms were recorded of the individual pieces as well as the entire nine-piece artwork.

Large Off-Axis Transmission Holograms

An off-axis transmission hologram, 50 by 60 cm, was recorded in LHAB's laboratory in Stockholm. The ***Kilroy*** art piece installed on the floor at the laboratory is shown in Figure 3. A separate laser beam was split off from the recording laser, which was directed to hit the heart, so that the hologram also shows a laser spot hitting the heart.

In Figure 4, CFR inspects the recorded glass plate illuminated with the argon-ion laser used for the recording. This hologram is now part of the Reuterswärd collection at Musée National d'Art Moderne in Paris. Another large-format art transmission hologram is ***Smoke Without Fire*** or ***Gateaux Gabor***, a 50-by-60-cm glass plate, also recorded at the LHAB lab. The hologram, which portrayed a burning cake, was made as a tribute to 1971 Nobel Laureate and holography inventor Dennis Gabor, to mark the 30-year anniversary of Gabor's 1947 paper on holography.

This is a nice example of how an interference pattern in a hologram could be used by an artist. He was able to visualize the heat from the burning candles through the recorded interference pattern in space. The heat above the candles created a tremendous 3D “smoke” pattern above the birthday cake. For stability reasons, the cake was made of wood and with white silicon sealant serving as whipped cream (Figure 5).

During the hologram recording exposure, the 30 candles were actually burning. The light emitted from the burning candles* (mainly in the yellow-red region of the spectrum) did not fog the green-sensitive 8E56 Agfa plate, which was exposed using a 514.5nm argon-ion laser wavelength. (* This light cannot, of course, be recorded in the hologram – thus the title, “Smoke Without Fire.”) After the plate was positioned in the plate holder, it was covered by a black cloth. The candles were lit and the black cloth was removed slowly to avoid air turbulence in front of the plate. After that, the exposure took place. The setup with a white background behind the cake is shown in Figure 6 with CFR lighting the candles. A photo of the finished hologram is reproduced in Figure 7.

Image-Plane Reflection Holograms

Finger Language is an edition of reflection holograms from 1973. It contains four different reflection holograms, on 20-by-25-cm glass plates, depicted in Figure 8. The four master holograms were recorded of CFR’s gold-painted hand with a HOLOBEAM pulsed ruby laser at RIT in 1972. The limited-edition (ten series) was produced in 1973.

Kilroy's Heart from 1975 is a reflection hologram (Figure 9). The gilt bronze heart used for the recording was created from a model in clay from an anonymous human heart in New York in September 1962. This bronze heart was used for producing the master hologram with the pulsed ruby laser at RIT in 1973.

Before recording the hologram, silver glitter flakes were emitted from above the heart, and the laser was fired when they were positioned around the heart. The effect was to simulate stars in space. The limited-edition white-light viewable reflection holograms were produced in 1975.

Another example is a hologram entitled *Cross Reference* in which Reuterswärd posed as Salvador Dalí. A photo from Paris of CFR and Dalí is shown in Figure 10. CFR’s moustache was shaped to form the letters **C** and **R**, which are the initials both of the work and of Reuterswärd’s first and last names.

The transmission master hologram was recorded with the RIT pulsed laser in October 1980. In Figure 11, CFR is depicted behind the hologram plate holder. The master hologram was used to produce the limited-edition image-plane reflection holograms. The 25-by-30-cm reflection hologram is shown in CFR signed all the hologram glass plates with a dentist’s drill, shown in Figure 13, and his signature in the lower right corner of a plate in Figure 14.

When CFR looked into one of the recorded transmission holograms he could see, through a mirror in the recorded virtual holographic space, the undeveloped plate mounted in its plate holder. He was fascinated that he was able to see the plate he was now looking through at an earlier time. This inspired him to make the *Hologram of a Hologram* drawing (India ink & wash) shown in Figure 15.

CFR has exhibited at many museums, art institutes and galleries around the world, especially in Germany, France, Sweden, Switzerland, and the USA. One exhibition, *KILROY, LAZY LASERS AND HOLY HOLOS* at the *Museum of Holography* in New York, took place between 8 September and 26 November 1978. The Museum has the *Smoke Without Fire – Gateaux Gabor* hologram in its collection (now part of the MIT Museum collection).