

The Early Art Holograms of Carl Fredrik Reuterswärd

By Hans I. Bjelkhagen

Selwyn Lissack reported on holographic art pieces by Salvador Dalí in the January 2014 *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 to this piece after that John Lennon was murdered in December 1980 in New York. He and John Lennon were friends and CFR wanted to mark this terrible sad event with a piece symbol to be recognized around the world.

On January 20, 1963, he announced somewhat eccentrically in the New York Herald Tribune that he was going to 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* art work.

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

In 1963, he got in 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,



Figure 1. *Non violence* outside UN headquarters in New York.



Figure 2. The January 20, 1963, New York Herald Tribune Ad.

Towards the end of the 1960's CFR met Nils Abramson at the Royal Institute of Technology (RIT) in Stockholm. Abramson had started laser and holography research at RIT already 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 co-operated 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 ten years. The art piece itself 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 art work.

Large Off-Axis Transmission Holograms

An off-axis transmission, 50 by 60 cm, hologram 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 Reuterswård collection at *Musée National d'Art Moderne* in Paris.



Figure 3. *Kilroy* installed in the LHAB lab in Stockholm.



Figure 4. CFR inspecting the recorded *Kilroy* hologram.

Another large-format art transmission hologram is the 1978 piece entitled *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 the 30-year anniversary of Gabor's 1948 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 thirty 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 514.5 nm argon-ion laser wavelength. After the plate was positioned in the plate holder it was covered by a black cloth. The candles were lit and slowly the black cloth was removed not to create any 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.



Figure 5. CFR and Hans Bjelkhagen with the Gabor cake. [Photo: Walter Hirsch]



Figure 6. CFR lighting the candles in the recording setup.

* This light can, of course, not be recorded in the hologram – thus the title: "*Smoke without Fire*".

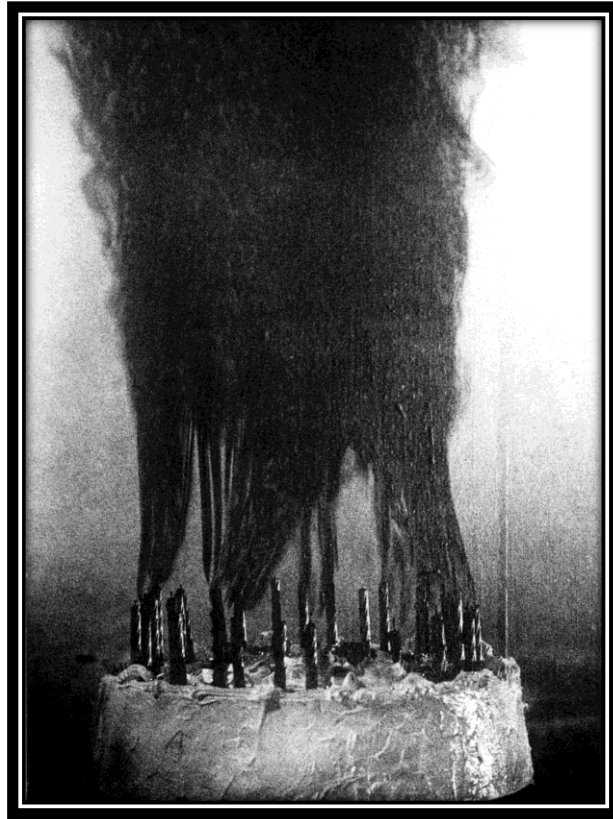


Figure 7. *Smoke without Fire* transmission hologram.

Image-Plane Reflection Holograms

Finger Language is an edition of reflection holograms from 1973. It contains four different reflection holograms, 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 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. This effect was to simulate stars in space. The limited-edition white-light viewable reflection holograms were produced in 1975.



Figure 8. The four *Finger Language* reflection holograms.

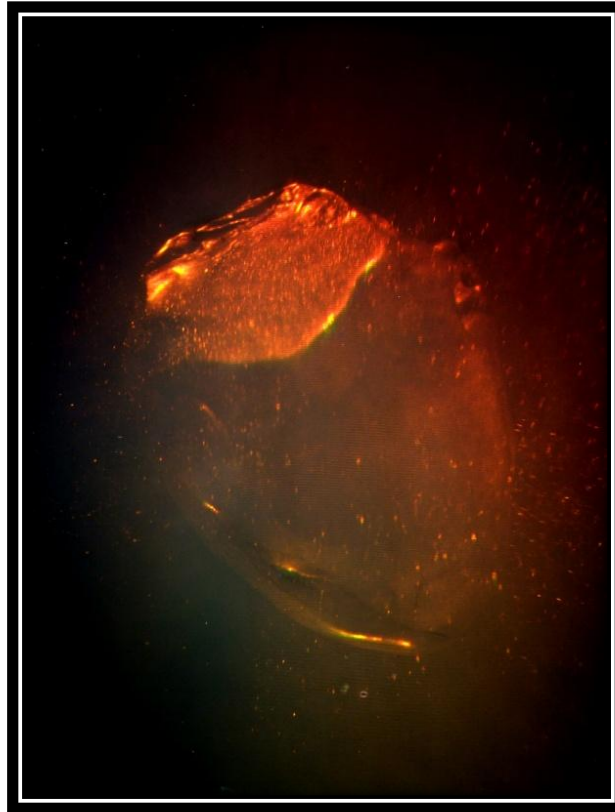


Figure 9. *Kilroy's Heart* reflection hologram.

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 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 Figure 12.



Figure 10. Salvador Dalí and CFR in Paris.



Figure 11. CFR seen through the hologram holder.

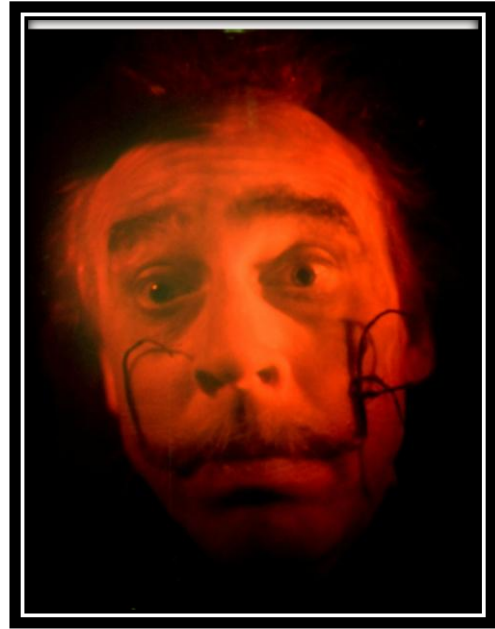


Figure 12. *Cross Reference* reflection hologram.

CFR signed all the hologram glass plates using 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 about 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.



Figure 13. CFR signing the glass holograms using a dentist's drill.



Figure 14. The signed glass plate.

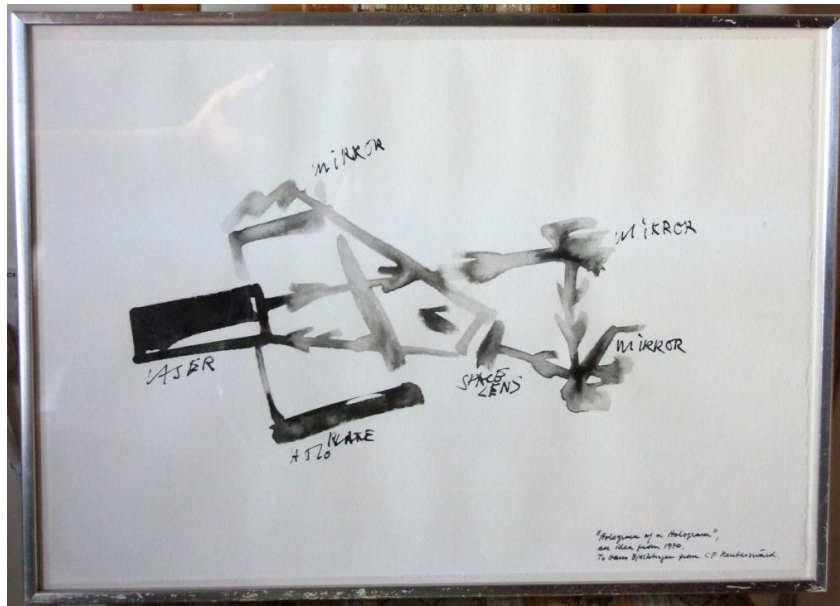


Figure 15. *Hologram of a Hologram* drawing.

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

At the *2nd European Congress on Optics Applied to Metrology, METROP* conference in November 1979 in Strasbourg, France, CFR made a drawing of me, reproduced in Figure 16, when I presented my paper.

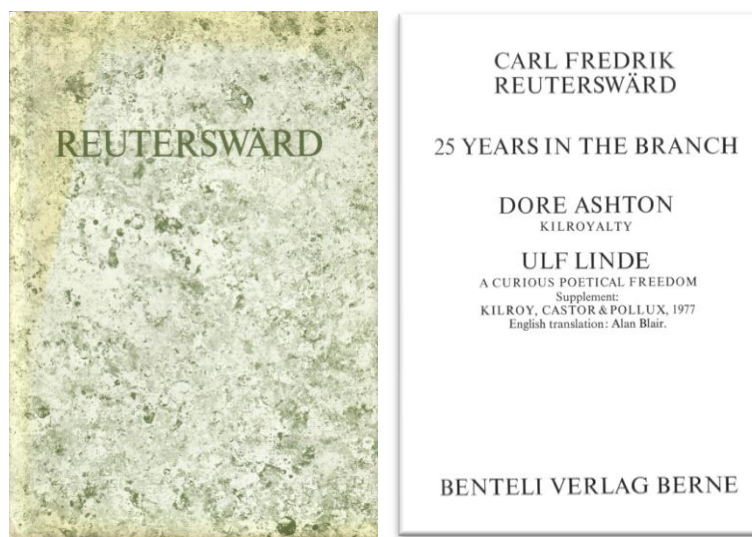


Figure 16. Hans Bjelkhagen in Strasbourg 1979, drawing by CFR.

Table: CFR Holograms

Title	Hologram type	Size [cm]	Date
KILROY, 1962 – 1972:			
<i>Whole Kilroy No. 1</i>	Off-axis transmission holograms for lasers, 9 pieces	4x5	1970-72.
<i>Kilroy's Heart</i>	Off-axis transmission holograms for white light	20x 25	1975
<i>Kilroy's Heart</i>	Image-plane reflection hologram	20x25	1975
<i>Whole Kilroy No. 2</i>	Off-axis transmission hologram	50x60	1977
LAZY LASERS & HOLY HOLOS, 1965 – 1974:			
<i>F-Faust</i>	Ready-made hologram, system 360/65 IBM, Houston		1967
<i>Medium's Memory</i>	Off-axis transmission hologram	9x12	1970-71
<i>You time & I time</i>	Off-axis transmission hologram	25x30	1972
<i>Finger Language</i>	Image-plane reflection holograms, 4 pieces	25x30	1973
<i>Head or Tail</i>	Image-plane reflection hologram	25x30	1975
<i>Fine Art of Banking</i>	Off-axis transmission hologram	50x60	1975
<i>Smoke without Fire</i>	Off-axis transmission hologram	50x60	1978

Carl Fredrik Reuterswärd (born 1934) is a Swedish painter and sculptor who lives in Switzerland. He studied with Fernand Léger in Paris 1951-1952 and was a professor of painting at The Academy of Fine Arts in Stockholm 1965-1969. He lives since 1969 in Bussigny/Laussane and in Paris. In 1974 he was a guest professor at Minneapolis School of Art, Minneapolis, Minnesota. Reuterswärd's early work, including laser and holography art pieces, is described in the book: **25 YEARS IN THE BRANCH**, Benteli Verlag Berne, Switzerland, (1977).



The 1977 book on Reuterswärd published by Benteli Verlag in Berne, Switzerland.