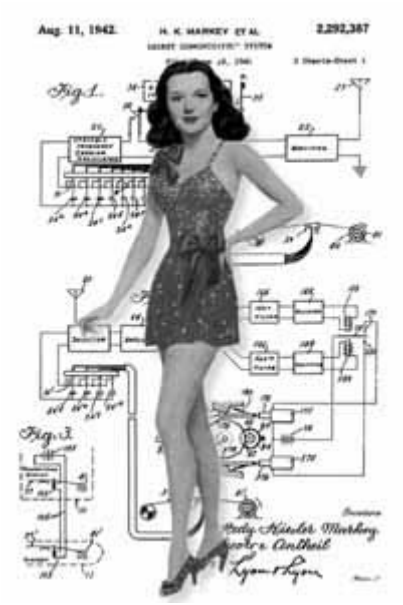
Richard Brem/Theo Ligthart (electronic ensign)
Hommage à Hedy Lamarr



Star: The presence of a divinity; supremacy; the eternal; the undying; the highest attainment; an angelic messenger of a god; hope (as shining in darkness); the eyes of the night. Stars are attributes of all Queens of Heaven, who are often star-crowned. The star is pre-eminently the symbol of Ishtar, or Venus, as morning and evening star. (…) The five-pointed star, upwards, is aspiration; light; the spiritual; education. Downwards, it is evil; witchcraft; black magic.

(J. C. Cooper: "An Illustrated Encyclopaedia of Traditional Symbols", London 1978)

Hedy Lamarr …

Hedy Lamarr, born in 1913 in Vienna as Hedwig Kiesler, was Austria's most successful export to Hollywood before Arnold Schwarzenegger. Max Reinhardt discovered her acting talents in the late 1920s, but she did not achieve fame until 1933 when her nude scene in the Czech film "Ecstasy" — the first scene of its kind in the history of the cinema — caused an international sensation. The film was widely banned, or only an expurgated version of it was permitted to be shown.

In that same year 1933, Hedy Kiesler married the Austrian industrialist Fritz Mandl, CEO of the Hirtenberger Patronenfabrik, then one of the world's largest arms producers. In 1937 she left her domineering husband and went to London, where she was discovered by MGM boss Louis B. Mayer, who brought her to Hollywood and gave her a new name. As Hedy Lamarr, she became one of the top actresses of the late '30s and early '40s, and America's number 1 sex symbol. In a career that lasted into the late '50s, she acted in over 25 films together with stars such as Clark Gable, James Stewart, Spencer Tracy and Judy Garland. And the persona that she created — the sensuous, dark-haired beauty — has exerted a significant and lasting influence on the cinema and popular culture. Catwoman, the comic book character created by Bob Kane in 1940, as well as Sean Young's portrayal of Rachael in Ridley Scott's 1982 film Blade Runner have something of Hedy Lamarr about them.

… as an inventor …

Following the outbreak of World War II, Hedy Lamarr, as a passionate opponent of the Nazis, wanted to contribute more than just propaganda to the Allied effort. As the wife of a leading arms manufacturer, she had been able to observe close-up the planning that went into the design of remote-controlled torpedoes. These had never gone into production, though, because the radio-controlled guidance system had proved to be too susceptible to disruption. She got the idea to distribute the torpedo guidance signal over several frequencies to protect it from enemy jamming. The concept's only weak point was the synchronization of the signal's transmitter and receiver.

In 1940, Lamarr and the American avant-garde composer George Antheil (1900—1959) were introduced by mutual friends. She described her idea to him, and he helped her to construct a device which would enable the signal to be synchronized.

In Europe and the US during the 1920s, Antheil and his compositional radicalism had created a stir both in and outside of the concert halls. As the self-styled "bad boy of music," he dismayed his audiences by integrating the sounds of machines into his works — the typewriter, electric doorbell, telephone, siren and airplane propeller were employed by Antheil as musical instruments. In collaboration with Fernand Léger, Dudley Murphy and Ezra Pound in the mid-1920s, Antheil had worked on the film Ballet mécanique for which he wrote the score. To play the music for this film, Antheil had originally wanted to use 16 player pianos which were to have been controlled via console, but the technology of the day foiled this plan, since the problem of the synchronization of the instruments could not be solved. Thus, as he worked together with Hedy Lamarr on the solution to the synchronization problem, Antheil was already quite familiar with the difficulties involved in synchronizing various different tonal sources (frequencies).

The idea leading to the practical realization of their torpedo guidance system ultimately came to Lamarr and Antheil while playing piano together, and was derived from a musical principle. Antheil laid out a system based on 88 frequencies corresponding to the number of keys on a piano. And for the construction, he had recourse to paper rolls, which he had also finally used to synchronize the player pianos in his work on Ballet mécanique. His artistic activities can thus be regarded as a precondition for the invention.

… of a technology for the 21st century

A patent application for a "secret communication system" was filed by Lamarr and Antheil in June 1941, and the patent was granted in August 1942. The US Navy took no notice of the idea during the war. It was not until the Cuban missile crisis that it was deployed by the military on a major scale. With the emergence of digital technology, Lamarr and Antheil's invention took on new significance — and received a new designation: the frequency hopping technique. Today, this technology not only constitutes the basis of the US military satellite defense system (Milsat), but also has a wide range of civilian uses chiefly related to cordless and cellular telephones. Frequency hopping is also a key component of so-called spread spectrum technology. In the field of wireless data transmission, spread spectrum is considered the very epitome of the technology of the future, because the spread spectrum principle not only enables one and the same frequency spectrum to be divided up among a large number of users, but also prevents unauthorized access to information by means of a wide variety of spread codes.

Today, Hedy Lamarr lives in semi-seclusion in the vicinity of Orlando, Florida. Last year, in recognition of their technical achievement, the inventors of this pioneering technology were

honored —George Antheil posthumously — in the US with the prestigious Pioneer Award of the Electronic Frontier Foundation, the Bulbie Gnass Spirit of Achievement Award, as well as a prize presented by Milstar (Lockheed Martin Missiles & Space, TRW and the US Air Force). With the installation Hommage à Hedy Lamarr, the actress and inventor Hedy Lamarr is now being honored for the first time in her homeland, Austria, as well.

The Installation

The leitmotifs of the audiovisual installation are the common genesis of military and communications technology, as well as the linkage of popular culture (Hedy Lamarr) and avant-garde modernism (George Antheil). An additional theme is the field of interplay between art and technology in which Hedy Lamarr and George Antheil were active even before their collaborative development of the frequency hopping apparatus. As a movie star, Hedy Lamarr was a highly desired object of cinematographic recording devices and a part of an industrial machinery of popular culture, while George Antheil emphasized a mechanistic aesthetic in his avant-garde compositions and integrated machines and mechanized instruments into his works.

The point of departure and the centerpiece of the installation is a five-pointed star whose form evokes those on the Hollywood Walk of Fame as well as the emblem of the US Army.

The video material displayed on the monitors consists mostly of clips from Hedy Lamarr's films, though it also includes World War II newsreel footage, contemporary text fragments, an animated depiction of how the frequency hopping device works, as well as graphics showing current uses of the invention. The thematic ordering of the visual information is structured by means of a rhythmic montage alluding to style elements of modernism in general and Antheil's musical ideas in particular. The use of a number of different media including audio, video, computer animation, text, etc. also suggests an aesthetic affinity to Antheil's multimedia opera projects such as Transatlantik. Through its synchronization of various different sources of information and the rhythmic montage of the visual materials it uses, Hommage à Hedy Lamarr can be regarded as an hommage to Antheil's work as well.

The installation is additionally underscored by a soundtrack featuring musical material connected with Hedy Lamarr's films and with George Antheil, and processed by the Viennese electronic musician Curd Duca.