

TOP SECRET

To: Mr. Bob Linder B-63
SAITH

From: D4K History and Public Affairs Staff

Re: Response to request for historical information.

1. The enclosed is in response to your request on 10 October for information concerning Boris Hagelin and ~~his~~ relationship to the United States government. Our research indicates that this is at least a 6-12 month project ~~at present~~ but we hope that what we have furnished will meet your immediate needs.

2. We shall continue to work on this project as our resources permit and when the resultant monograph is completed it will be a useful addition to our U.S. Cryptologic History Series.

~~It is requested that you report on your activities~~

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C-36
M-209

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Arvid Gerhard Damm

Boris C. W. Hagelin born July 2, 1882 in the

Caucasus

B. W. Hagelin

IP

Arvid's
like names

In 1916 Commander Captain Arvid Gerhard Damm of the Swedish Royal Navy and Arvid Gerhard Damm founded Arvidbolaget Cryptograph, a company designed to make commercial cipher machines. Among the investors of the firm were Emanuel Nobel, the nephew of Alfred Nobel & K. W. Hagelin who managed the Stolabrothers' oil company in Russia of the Swedish consul-general in St. Petersburg.

In 1922 Hagelin's son, Boris Caspar Wilhelm Hagelin joined Arvidbolaget Cryptograph. He had graduated from the Royal Institute of Technology in Stockholm in 1918 with a degree in mechanical engineering. He had worked for six years for ASEA, Sweden's version of General Electric, and had spent one year in the United States working for Standard Oil of New Jersey.

In 1925 Boris Hagelin discovered that the Swedish military was planning to purchase an English machine - By modifying one of Damm's cipher machines, he made it more suitable for field use than the English and offered it as the B-21 to the Swedish Army. It was accepted and a large order for the cipher machine was placed in 1926.

In 1937 A. G. Damm died and the Hagelin interests bought the firm & reorganized it as Arvidbolaget Cryptoteknik. Boris Hagelin managed the company. Hagelin began producing printing cipher machines which were faster, more accurate, and more economical in terms of manpower than rotating mechanisms like the English. (Kahip 4/26)

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~~The Turing pair~~ ^{reclut-pyid} The French General Staff requested that
produce a ^{reclut-pyid} cipher machine which was portable and
and which could print up to 26 letters making it a
one man operation. The result was the C-36 ^{cypher} machine
which ~~the French~~ In 1935 the French ordered 5000 of the
machines and ~~Hagelin was~~ ~~Hagelin's fortune~~
This marked the Turing pair for the company and
for Hagelin which ~~marked the~~ ~~beginning of~~
which put the company on a solid footing and
~~enabled the company to~~ ~~even further~~ laid the groundwork
for future successes.

~~In 1936 Hagelin began corresponding with~~
According to David Kahn,
It would appear that Hagelin's first
contact with ~~American~~ ^{United States} cryptologic authorities ~~occurred~~
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According to David Kahn, Hagelin began
corresponding with American cryptologic experts in 1936
in reference to the C-36 ^{cypher} machine. He visited the U.S.
in 1937 and in 1939. William F. Friedman evidently Hagelin's
first met William F. Friedman on these visits. ^{A Friedman}
~~business~~ ~~the two developed~~ ~~close~~ ~~friendship~~ ~~which~~ ~~lasted~~ ~~until~~ ~~Friedman's~~ ~~death~~ ~~in~~ ~~1962~~.
It is reported to have offered suggestions to Hagelin for
improving the ~~C-36~~ in 1940 Hagelin and his
wife managed to escape Europe with ~~his~~ blueprints
and 27 ~~C-36~~ machines. Later Hagelin was able to
smuggle 50 more machines into the U.S. By that time
the U.S. had tested his C-36, ^{with improvements suggested by Friedman} and decided to accept
it as its medium-level cryptographic system. It
was designated the M-209 and it saw service in
military units from division to battalion level. In
1942 Smith's Corona Typewriters, Inc. began producing
700 of these machines a day in its Stratton, New York
factory. More than 145,000 were produced and
Hagelin's royalties ran into the millions. He became
the first - and the only - man to become a millionaire
from cryptology. (John p 427)

In 1944, Hagelin returned to Sweden. Hagelin thought ^{that as the war ended} the cipher machine business ^{was} finished but events proved him wrong. The ~~the~~ ^{coming of the} ~~the~~ ^{then} ~~the~~ ^{break-up of the colonial} empires and ~~the~~ ^{the} ~~the~~ ^{formation of dozens of new} nation ~~states~~ ^{states} created a new market for cipher machines.

~~In 1948~~ ~~Hagelin~~ ~~returned~~ ~~to~~ ~~Sweden~~ ~~where~~ ~~he~~ ~~re-established~~ ~~the~~ ~~company~~ ~~in~~ ~~Stockholm~~ ~~and~~ ~~the~~ ~~war~~ ~~was~~ ~~now~~ ~~proved~~ ~~to~~ ~~be~~ ~~somewhat~~ ~~temporary~~. In 1948 Hagelin moved his development work to Zug, Switzerland because of a Swedish law which allowed the government to appropriate inventions it needed for national defense. In 1959, Hagelin moved the entire firm to Zug where he incorporated it as Crypto Abhängesellschaft (or Crypto A.S.).

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PL 86-36/50 USC 3605

the machine, Hagelin had been improving the M-209 and was also producing new cipher machines for both commercial military and diplomatic use. He filed patent applications for some of his new machines in the United States, Switzerland, France, and Italy. Through an informal contact (probably Friedman), the Armed Forces Security Agency was not only aware of Hagelin's new systems but were somewhat concerned lest Hagelin's new, improved cipher machines might come from an unreliable readable source in Switzerland.

matter was presented to the Armed Forces Security Agency Council. AFSAC authorized the information to be shared with the Department of State Intelligence Council.

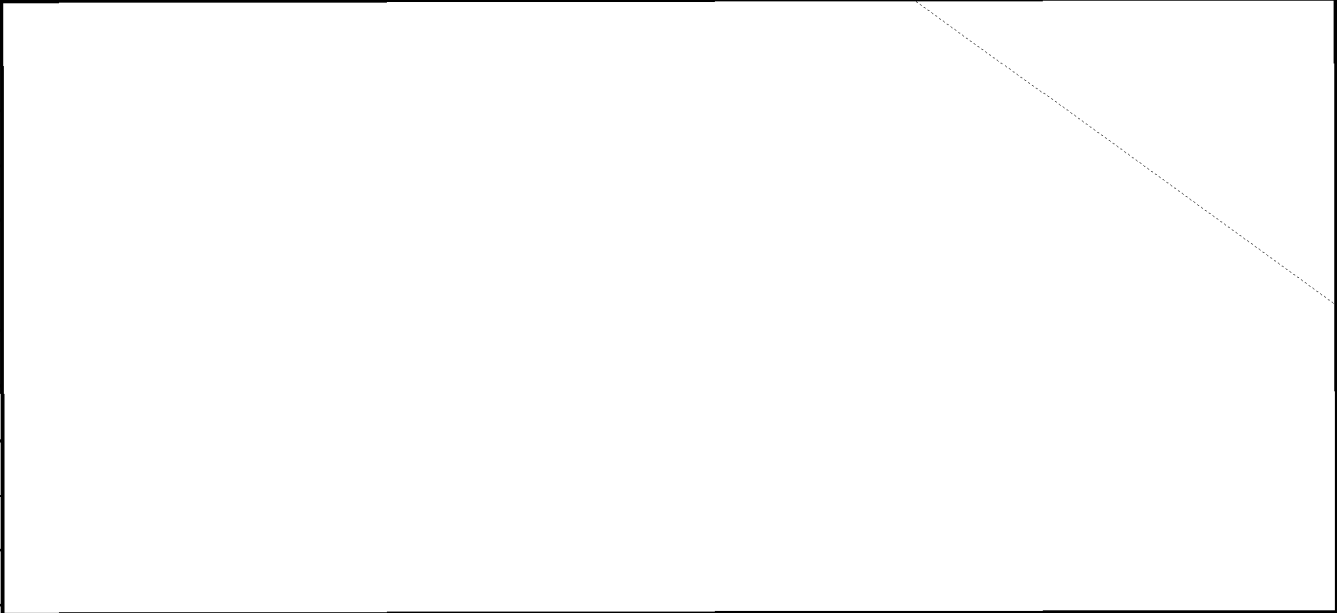
AFSA, AFSAC, and the CIA are to regularly discuss this

of complexity of complications presented by the possible merger of Hagelin's firm with that of Siemens and their well known cipher manufacturers of cipher machines.

* The exact date has yet to be determined but it is somewhere between 1951 and 1957.

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several government contracts for
ship machines

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In 1944 Hagelin returned to Sweden. Hagelin thought that as the war ended the cipher machine business was finished, but events proved him wrong. The coming of the cold war ^{as well as} ~~and then~~ the break-up of the colonial empires and resultant formation of dozens of new nations ~~both~~ created a new market for cipher machines.

The re-establishment of Aktiebolaget Cryptoteknik in Stockholm after the war proved to be somewhat temporary. In 1948 Hagelin moved his development work to Zug, Switzerland because of a Swedish law which allowed the government to appropriate inventions it needed for national defense. In 1959, Hagelin moved the entire firm to Zug where he incorporated it as Crypto Aktiengesellschaft (~~as~~ Crypto A.G.).

Meanwhile, Hagelin had been improving the M-209 and was also producing new cipher machines for commercial, military, and diplomatic use. He filed patent applications for some of his new machines in the United States, Switzerland, France and Italy. Through an informal contact (probably Friedman), the Armed Forces Security Agency was not only aware of Hagelin's new systems but were somewhat concerned lest Hagelin's newer, more secure machines ~~might~~ cause some previously readable sources to disappear.

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[Redacted]

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[Redacted]

the possible merger of Hagelin's firm with that of Siemens, another well known manufacturer of cipher machines.

[Redacted]

that he continued to receive government contracts for cipher machines.

In 1916 Arvid Gerhard Damm and Commander Captain Olof Glydin of the Swedish Royal Navy founded Aktiebolaget Cryptograph, a company designed to make commercial cipher machines. Among the investors in the firm were Emanuel Nobel, the nephew of the famous Alfred Nobel, and K. W. Hagelin, who managed the Nobel brothers' oil company in Russia and at one time was the Swedish Consul-General in St. Petersburg.

In 1922 Hagelin's son, Boris Ceasar Wilhelm, joined Aktiebolaget Cryptograph. Although he had been born in Russia, he had graduated from the Royal Institute of Technology in Stockholm in 1914 with a degree in mechanical engineering. He had worked for six years for ASEA, Sweden's version of General Electric, and had spent one year in the United States working for Standard Oil of New Jersey.

In 1925 Hagelin discovered that the Swedish military was planning to purchase an Enigma cipher machine. By modifying one of Damm's cipher machines, he made it more suitable for field use than the Enigma and offered it as the B-21 to the Swedish Army. It was accepted and a larger order for the cipher machine was placed in 1926.

In 1927 A. G. Damm died and the Hagelin interests bought the firm and reorganized it as Aktiebolaget Cryptoteknik. Boris Hagelin managed the company. Hagelin began producing printing cipher machines "which were faster, more accurate, and more economical in terms of manpower than indicating mechanism like the Enigma." (1)

The turning point for the fortunes of the Aktiebolaget Cryptoteknik came in 1934. The French General Staff requested that the firm produce ^a pocket-sized cipher machine which could print cipher text, thus making it a one man operation. The result was the C-36 cipher machine. In 1935 the French ordered 5,000 of the machines which put the company on a solid footing and laid the groundwork for future successes.

According to David Kahn, Hagelin began corresponding with American cryptologic experts in 1936 in reference to the C-36 cipher machine. He visited the U.S. in 1937 and in 1939. Evidently Hagelin first met William F. Friedman on these visits. A friendship between the two developed during this period which lasted until Friedman's ~~draft~~^{death} in 1969. In 1940 Hagelin and his wife managed to escape Europe with blueprints and ^{two} C-36 machines. Later Hagelin was able to smuggle 50 more machines into the U.S. By that time the U.S. had tested his C-36, with some improvements suggested by Friedman, and decided to accept it as its ~~its~~ medium-level cryptographic system. It was designated the M-209 and it saw service in military units from division to battalion level. In 1942 Smith and Corona Typewriters, Inc., began producing 400 of these machines a day in its Groton, New York factory. More than 140,000 were produced and Hagelin royalties ran into the millions. "He became the first and the only man to become a millionaire from cryptology." (2)

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