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Crypto AG MINERVA

Hagelin-Cryptos · 1950-2019

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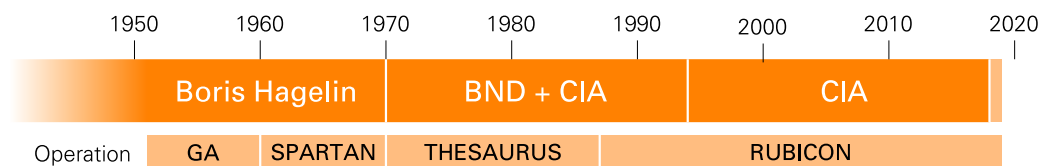
Crypto AG was a manufacturer of **cryptographic** and communications equipment, based in Steinhäusen (Switzerland), with a world-wide customer base and offices in several countries. It was established in 1952 ¹ by Russian-born Swede **Boris Hagelin**, who gradually moved the activities of his Swedish company **AB Cryptoteknik** to Switzerland after restrictive laws had been proposed in Sweden. As a tribute to its founder, the company logo **+** was based on his name. Crypto AG was liquidated on 31 October 2019 after its activities had been taken over by **Crypto International AG**.

► [Crypto AG \(Hagelin\) cipher machines](#)



As Switzerland is a neutral country, Crypto AG could do business throughout the entire world, with virtually no restrictions. The company's ownership has always been a mystery, supposedly even to the management [1]. In the past, the company has often been **accused** of providing **backdoors** to make their devices **readable** for foreign **intelligence agencies**. Crypto AG has always denied this.

It has meanwhile become clear that from 1951 to 1960 a **Gentleman's Agreement (GA)** existed between **Boris Hagelin** and the US **National Security Agency (NSA)**, and that from 1960 to 1970, Crypto AG had a **licencing agreement** with the American **Central Intelligence Agency (CIA)** [12].



But the most striking discovery was that, in 1970, Crypto AG had secretly been purchased by the German **BND** and the American **CIA**, in a project known as **Operation THESAURUS** — later renamed **RUBICON**. In 1994, the **CIA** became the sole owner, and in 2019 the company was dissolved, after the product range and some personnel had been taken over by **Crypto International AG** [12]. On 3 July 2020, following actions by the Swiss Government, **Crypto Internal** fired its entire staff [15].

► [More about Operation RUBICON](#)

1. More precisely: the company was founded in 1950, but did not become operational until 1952.

Related subjects



Company names

- 1916 **A.B. Cryptograph** (with Arvid Gerhard Damm)
- 1930 **A.B. Ingeniörsfirman Teknik**
- 1939 **A.B. Cryptoteknik**
- 1952 **Crypto AG**
- 2018 **Crypto Schweiz AG** **CyOne Security AG** **Crypto International AG**

History

The history of Crypto AG starts around 1922, when Russian-born Swede Boris Hagelin was asked by the Swedish Nobel family to become a financial controller at **AB Cryptograph** in Stockholm — a company involving **Arvid Gerhard Damm**. The Nobel family had put a significant sum of money into the business and wanted the son of a friend, **Boris Hagelin**, to look after their investment.

By 1925, Hagelin had become the acting director of the company, whilst **AG Damm** was persuing business in France. In the meantime, **Hagelin** had developed the **B-21**, a cipher machine that was based on Damm's erlier design of the B-18. He improved the design by adding his (now) famous pin-wheels, and offered it to the Swedish Army.

After **AG Damm** died in 1927, **AB Cryptograph** was liquidated in 1932 and replaced by **AB Cryptoteknik**, Hagelin's first own company. In 1935, he developed the **C-35** at the request of the French Army — the first of the C-machines.



The **C-35** was followed by the **C-36** — the machine that would change his life. At the outbreak of WWII, he took the machine to the US, where an improved version became known as the **M-209**. By the end of the war, over **140,000** units had been built in America, and **Hagelin** was a millionaire.

After the war, when Sweden was about to introduce several restrictive laws, Hagelin decided to move to neutral Switzerland, where he settled down in Zug under the name **Crypto AG**. After a brief cooperation with **Dr. Edgar Gretener** involving online cipher machines, he decided to go his own way, and developed the **TC-52**. Over the course of the following years, the business was gradually moved from Stockholm (Sweden) to Zug (Switzerland), where it remained until 2021. ¹

- [More about Boris Hagelin](#)
- [Read Hagelin's personal biography \(English\)](#)
- [Original manuscript of the biography \(German\)](#)

¹. In 1966, the company moved to nearby Steinhausen. In 2019, Crypto AG was liquidated after its portfolio and personnel had been taken over in 2018 by **Crypto International AG**.

Controversy

Over the years, Crypto AG has regularly been accused of selling rigged equipment or, in more popular terminology: equipment with a *backdoor*, which makes some of the devices *readable* for certain Intelligence agencies (such as the **NSA**). As Crypto AG was based in (neutral) Switzerland, they were able to supply equipment to most countries in the world with virtually no restrictions.

Despite Hagelin's worldwide success and the lack of evidence of rigged machines, the rumours were persistant, not least because of the increased suspicion from people within the company. Some of them reached out to the press – such as in the case of sales representative **Hans Bühler** (see below) – and sometimes the press reached out to them. In December 1995, The Baltimore Sun published a series of short articles [10] about how the **NSA** had supposedly influenced the machines of the Swiss company Crypto AG. Such stories were always rejected as 'pure invention'.

In 2014, it came to light – from released documents of the **Friedman Collection** – that there had been some kind of **Gentleman's Agreement** between Hagelin and the **NSA** from 1951 onwards. As part of this deal, Hagelin would not sell secure machines to certain countries. And in February 2020, **ZDF**, **SRF** and The Washington Post revealed that in 1970 the company had been secretly purchased by the **BND** and the **CIA**, and that from 1994, **CIA** had been the exclusive owner [12].

- [The Gentleman's Agreement \(1951–1969\)](#)
- [Operation RUBICON \(1970–2018\)](#)

The Friedman Collection

In 2014, the **NSA** released more than 7600 documents [5], amounting to over 52,000 pages of historical material relating to the career of **William F. Friedman** (1891–1969), who is considered the dean of American Cryptology. Although some documents have been fully declassified, most of them are still heavily redacted as – according to the **NSA** – they may contain information that could harm national security or any individuals or companies mentioned in those documents.

It is no secret that, at a personal level, **Hagelin** and **Friedman** were good friends. They both grew up in the Russian Empire, and shared an interest in historical cipher machines. Furthermore, they

both suffered from depressions. The two became friends during **WWII**, after **Hagelin** had 'escaped' to the **US** in March 1940 and sold the design of the **M-209 cipher machine** to the Americans, who built no less than **140,000** of them. After the war, they maintained their friendly contact.

Among the released documents are hundreds of letters between Friedman and Hagelin. Most of these letters are of a personal nature, but some of them contain explicit **NSA** material. Much of this material was confiscated by **NSA** several years after Friedman's death. An **AFSA** report of 12 April 1951 speaks of: *AFSA negotiation via C/A with Mr. Hagelin of AB Cryptotechnik.*

In a memorandum of 5 February 1954, the **NSA** expresses its concerns about newly announced Hagelin cipher machines, such as the **CX-52** and the **T-52**, and asks Friedman to investigate this.



Friedman is allowed to make a proposal to Hagelin on behalf of the director of the **NSA (DIRNSA)**. It is further agreed that Friedman will use his personal stationery and his home address for any further correspondence with Hagelin, in order not to ring any bells. The result is that Hagelin and **DIRNSA** enter into what they call a **Gentleman's Understanding**. In the following years, the details of the understanding – by then known as the **Gentleman's Agreement** – are revised several times.

► [The Gentleman's Agreement](#)

The Hans Bühler affair

In 1992, Crypto AG's top sales representative – **Hans Bühler** – was arrested in Iran on dubious grounds. He spent the next nine months in an Iranian prison – where he was interrogated three times a day – and was released in January 1993, after a bail of US\$ 1,000,000 had been paid.

After his release, he was severely traumatised, and claimed that the company had not done enough to expedite his release. He also claimed that the cipher machines that Crypto AG had sold to Iran (and to other countries) were rigged; in other words: that they contain a **backdoor** — a matter the Iranians had questioned him about.

In the following months, Bühler got caught in a tangle of disputes, which eventually caused him to get fired. This didn't stop him from talking to the press though, and became the subject of Res Strehle's book shown in the image on the right.



Since Hans Bühler went public, some of his former colleagues have decided to step forward as well. Former software engineer Jürg Spöndli confirmed that the company was visited frequently by **NSA specialists** and that on several occasions he was instructed by his manager to swap his cryptographic algorithm, for an alternative one (allegedly supplied by the **NSA**) that was clearly weaker [14]. This case is very similar to the **deliberate weakening of the Philips PX-1000**.

The Swiss Federal Police investigated some of the allegations but said it was not able to find any proof. In February 2020 it was revealed that at the time of the Bühler affair, the company – Crypto AG – was jointly owned by the German **BND** and the American **CIA**, which means that Bühler and his dissident colleagues had been right all along. According to internal **CIA** and **BND** documents, the case of **Hans Bühler** – to them known by the cryptonym **HYDRA** – was the most damaging one in the history of **Operation RUBICON** — the secret purchase of Crypto AG (**MINERVA**). In fact it was one of the reasons for the German Government to back out of the covert operation in 1994 [12].

► [More about Hans Bühler](#)

Operation RUBICON THESAURUS

In February 2020, it was revealed that for many years, Crypto AG had been owned jointly by the German [Bundesnachrichtendienst \(BND\)](#) and the American [Central Intelligence Agency \(CIA\)](#). In a secret project, that was internally known as [Operation THESAURUS \(later: RUBICON\)](#), BND and CIA had bought Crypto AG in June 1970. It gave the agencies control over Crypto AG's algorithms, and allowed them – indirectly – to control its customers. It made the equipment that was used by governments all over the world – including some of their Western partners – *readable* to them.

➤ [Operation RUBICON](#)

The split 2018

In January 2018 — well before [Operation RUBICON](#) became known to the public — it was announced that on 1 February 2018, the company would be split into two new companies that would handle the national and the international (Cyber) security business respectively [9]. The approximately 150 staff would be split evenly between the two companies:

- [CyOne Security AG](#)
 - [Crypto International AG](#)
- [Crypto-Schweiz AG](#) management buyout
part of [Crypto International Group AB](#), Sweden

Both companies remained in Zug (Switzerland), although the international branch was now part of the Swedish [Crypto International Group AB](#), owned by the Swedish entrepreneur Andreas Linde. The national branch was the result of a management buyout, led by Robert Schlup, Giuliano Otth (previously the CEO of Crypto AG) and Thomas Meier (CEO of the affiliated [InfoGuard AG](#)).

Note that [Crypto International AG](#) was a completely new firm, registered at the existing address, whilst the original [Crypto AG](#) was officially liquidated on 31 October 2019. The company's assets were transferred to [The Crypto Group AG \(TCG\)](#) on the same day. The assets of the licencing company – [Prime Technology Licencing AG \(PTL\)](#) – had already been transferred to [TCG](#) on 17 January 2018. PTL was liquidated on 17 January 2018. TCG is in liquidation (August 2023) [19].

The downfall 2020

Following the revelations of the secret [Operation RUBICON](#) in February 2020 by The Washington Post, ZDF Television and SRF Television, the Swiss Government withdrew the export licence of [Crypto International AG](#), pending a formal investigation by the Swiss Parliament and a criminal investigation by the Swiss Federal Police. On 3 July 2020, the Swiss newspaper *Neue Zürcher Zeitung* (NZZ) revealed that [Crypto International AG](#) was to layoff 83 of its 85 employees [15].

On 11 February 2021, the company moved its legal seat from Steinhausen to a new address in Hünenberg and updated its website accordingly.

By June 2021 the old premises in Steinhausen was abandoned and the famous CRYPTO-logo with the stylish **+** was removed from its facade.

According to the local newspaper *Zuger Zeitung*, plans were underway for demolition of the 1966 factory and the administration buildings to make room for approx. 200 apartments [16].



The image above was made on 1 April 2021 by professional photographer Patrick Hürlimann in Steinhausen, when the company logo was removed from the now abandoned building in Steinhausen. Over the course of the past year, Patrick has made an impressive series of photographs of the downfall of the once so dominant and famous Swiss company [17]. ➤ [More photographs](#)

House magazines

For many years, Crypto AG issued a house magazine at regular intervals – typically three times a year – that was sent to its international customer base. In later years, these magazines were also available in different languages.

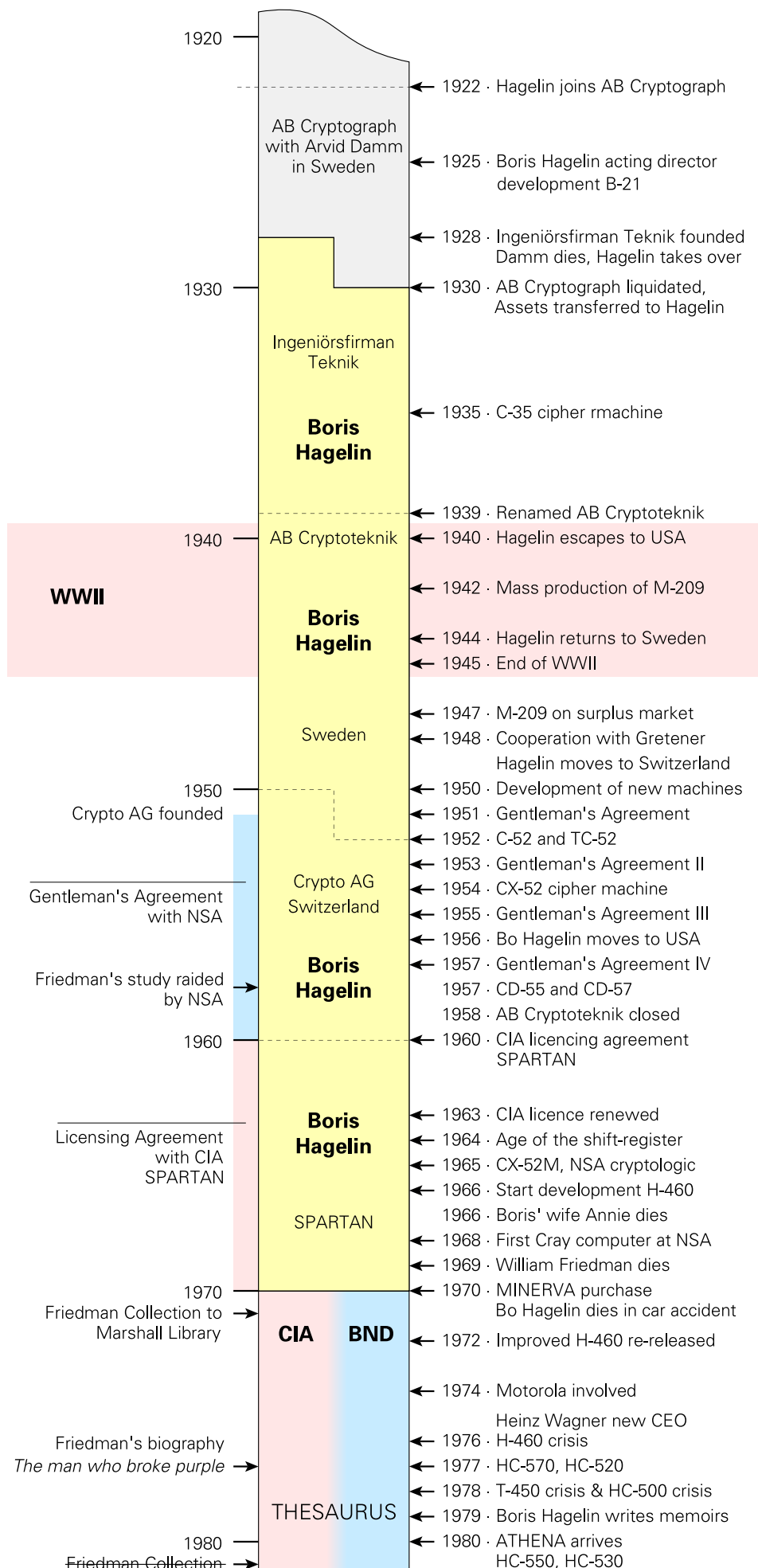
As these magazines give a good insight in the history of the company and its products, we have made some of them available for download.

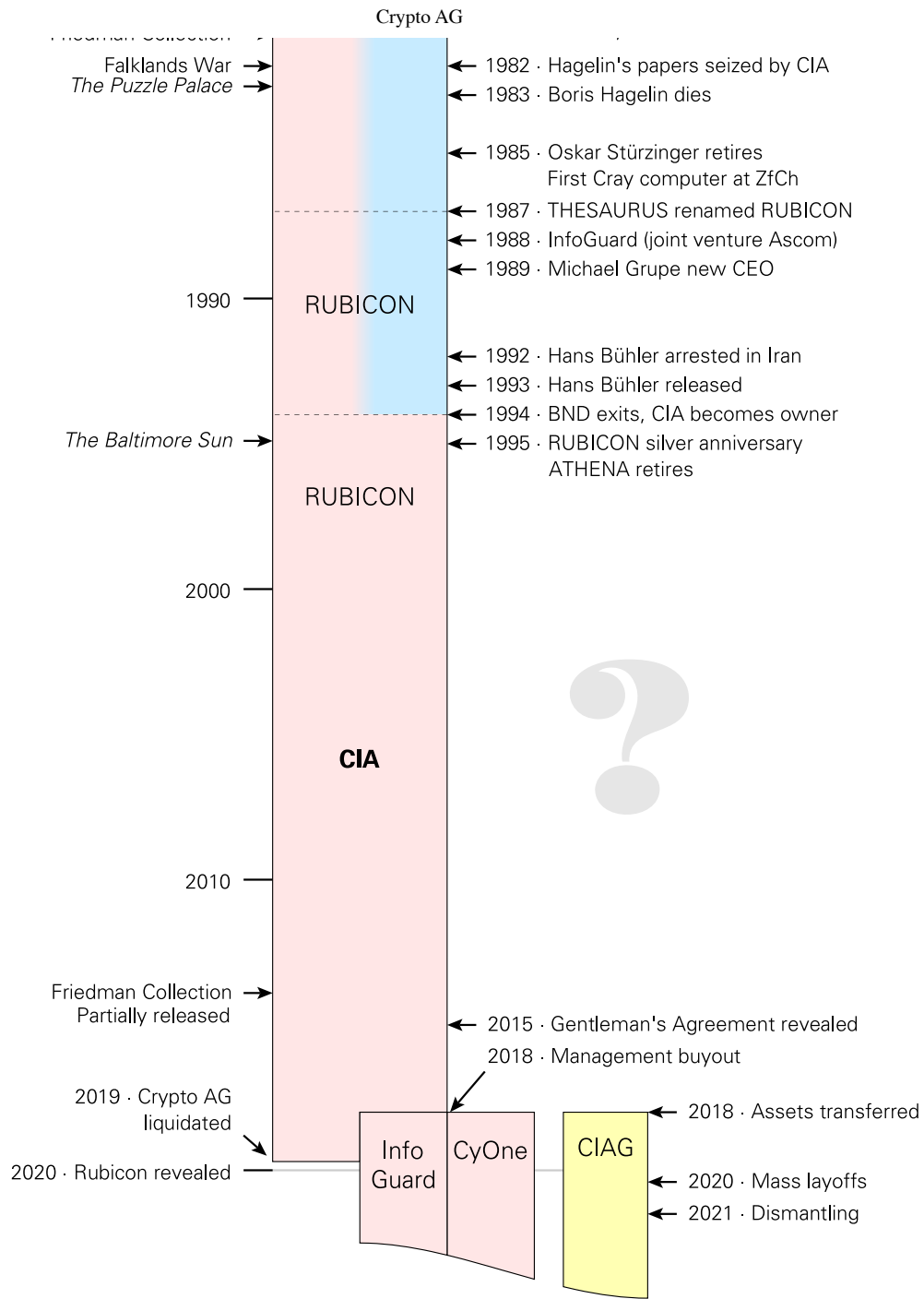
➤ [Overview of Crypto AG Magazines](#)



Timeline

The timeline below provides a graphical presentation, in chronological order, of the ownership of the company, its predecessor, its successors and important events in its history. It also shows the involvement of (foreign) intelligence services, in particular the [Gentleman's Agreement with the NSA \(1951–1960\)](#), the Licencing Agreement with the CIA (1960–1970) — also known as SPARTAN — and the MINERVA purchase (1970–2018) — also known as [Operation THESAURUS](#) or [RUBICON](#).





CyOne – initially known as **Crypto Schweiz AG** – was split-off on 1 February 2018 in the form of a management buyout led by Robert Schlupp, Giulliano Otth (then CEO of Crypto AG) and Thomas Meier (then CEO of **InfoGuard**). The company took over part of the Crypto AG assets and part of the workforce. They are currently active in the cyber security market.

InfoGuard (CIA: AURORA) was a subsidiary of Crypto AG, established in 1988 as a vehicle to sell equipment to the civil market. From 1989 to 1991, **InfoGuard** was a joint venture between Crypto AG and **Ascom**, and from 1991 onwards a full subsidiary of Crypto AG again. On 25 January 2018, **InfoGuard** was split-off as result of a management buyout lead by the same people as in the CyOne buyout: Robert Schlupp, Giulliano Otth (then CEO of Crypto AG) and Thomas Meier (the current CEO of **InfoGuard**). Like **CyOne**, this company is active on the cyber security market.

Crypto International AG, was a new company – owned by the Swedish entrepreneurs Andreas and Emma Linde – that took over the international business of Crypto AG, part of its workforce and the premises in Zug on 1 February 2018. Shortly after **Operation RUBICON** was publicly exposed, the company was largely dismantled in 2020/2021, as its export licence had been revoked.

Patents

- US 2,089,603
Ciphering machine (C-35)
Boris Hagelin. Filed 23 August 1935. Related to ► [C-35 machine](#).
- US 2,247,170
Ciphering machine (BC-38)
Boris Hagelin. Filed 28 November 1938. Related to ► [BC-38 machine](#).
- US 2,394,765
Ciphering and deciphering mechanism
Boris Hagelin. Filed 24 July 1939.
- US 2,765,364
Keying mechanism (CX-52)
Boris Hagelin. Filed 5 October 1940 as ► [US 188,546](#) ¹
Placed under Secrecy Order on 14 September 1951 at request of [AFSA \(NSA\)](#).
Released on or after 27 March 1952. Published 2 October 1956.
- US 2,802,047
Electric switching device for ciphering apparatus
Boris Hagelin. Filed 16 October 1953. Published 6 August 1957. This patent actually interferes with a secret US patent for the same, filed around 1940, but Hagelin was not informed about this in 1953. The principle of *re-entry* described in this patent was also used in the [American KL-7 \(then: AFSAM-7\)](#) and later in the [Russian Fialka](#).
- US 4,095,046
Electronic Enciphering and Deciphering Apparatus in the form of a Pocket Calculator
Peter Frutiger and Bruno Gemperle, on behalf of [AEH](#). Related to ► [HC-520](#)
Filed 1 November 1976, priority date 11 November 1975.

1. Declassified by NSA on 17 June 2014 (EO 13526).

References

1. [Boris Hagelin, *Die Geschichte der Hagelin-Cryptos*](#)
Original manuscript by Boris Hagelin in German language. Zug, Fall 1979.
2. [Boris Hagelin, *The Story of Hagelin Cryptos*](#)
English translation of the above. BCW Hagelin, Zug, Spring 1981. Later edited by David Kahn and published in *Cryptologia*, Volume 18, Issue 3, July 1994, pp 204–242.
3. [Hans Stadlin, *100 Jahre Boris Hagelin 1982–1992 \(German\)*](#)
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4. [Wikipedia, *Crypto AG*](#)
Retrieved July 2015.
5. [NSA, *William F. Friedman Collection of Official Papers*](#)
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6. [Bruce Schneier, *NSA backdoors in Crypto AG Cipher Machines*](#)
11 January 2008. Retrieved July 2015.
7. [Bruce Schneier, *Crypto-Gram, June 15, 2004 – Breaking Iranian Codes*](#)
15 June 2004. Retrieved July 2015.
8. [BBC Radio 4, *Document – The Crypto Agreement*](#)
Evidence of a secret deal between Crypto AG (Hagelin) and the NSA.
28 July 2015, broadcast, presented by Gordon Corera.
9. [Crypto AG, *Crypto AG is gearing up for future growth*](#)
24 January 2018.
10. [Scott Shane & Tom Bowman, *Spy string: Few at the Swiss factory knew...*](#)
Baltimore Sun, 10 December 1995.
11. [Scott Shane & Tom Bowman, *NSA's ... Rigged encryption machines*](#)
Baltimore Sun, 10 December 1995.
12. [Paul Reuvers & Marc Simons, *Operation RUBICON*](#)
Crypto Museum, 19 March 2020.
13. [Verschlüsselt, *Der Fall Hans Bühler*](#)
ISBN 3-85932-141-2. 1994.

14. Line Dugstad & Osman Kibar, *Den skjulte partneren*
Dagens Næringsliv. Website. 2 January 2015 (updated 13 February 2015).
15. Marcel Gyr, *Crypto International enl sst fast die gesamte Belegschaft — als Folge eines fragw rdigen Entscheids des Bundesrats*
Neue Z rcher Zeitung (NZZ), 3 July 2020.
16. Zuger Zeitung, *The final dismantling of Crypto AG*
8 June 2021. Photographs: Patrick H rlimann, 7 April 2021.
17. Patrick H rlimann, *Taking down the CRYPTO logo from the building in Steinhausen*
1 April 2021. Reproduced here with permission from the artist.
18. Monetas Handelsregister, *TCG Legacy*
Retrieved August 2023.

Further information

- [Crypto AG \(Hagelin\) cipher machines on this website](#)
- [The Gentleman's Agreement with the NSA](#)
- [Operation RUBICON — the secret purchase of Crypto AG](#)
- [Boris Hagelin, the founder](#)

- [Crypto International AG](#)
- [Crypto AG website \(off-site\)](#)
- [InfoGuard, a former subsidiary](#)
- [CyOne \(Crypto Schweiz AG\)](#)
- [Index of manufacturers](#)

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