

# Thing (listening device)

**The Thing**, also known as **the Great Seal bug**, was one of the first covert listening devices (or "bugs") to use passive techniques to transmit an audio signal. Because it was passive, being energized and activated by electromagnetic energy from an outside source, it is considered a predecessor of current RFID technology.<sup>[1]</sup>

## Operating principles

The Thing, designed by Léon Theremin,<sup>[2]</sup> was very simple by today's standards. It consisted of a tiny capacitive membrane connected to a small quarter-wavelength antenna; it had no power supply or active electronic components. The device, a passive cavity resonator, became active only when a radio signal of the correct frequency was sent to the device from an external transmitter. Sound waves caused the membrane to vibrate, which varied the capacitance "seen" by the antenna, which in turn modulated the radio waves that struck and were retransmitted by The Thing. A receiver demodulated the signal so that sound picked up by the microphone could be heard, just as an ordinary radio receiver demodulates radio signals and outputs sound.

Theremin's design made the listening device very difficult to detect, because it was very small, had no power supply or active components, and did not radiate any signal

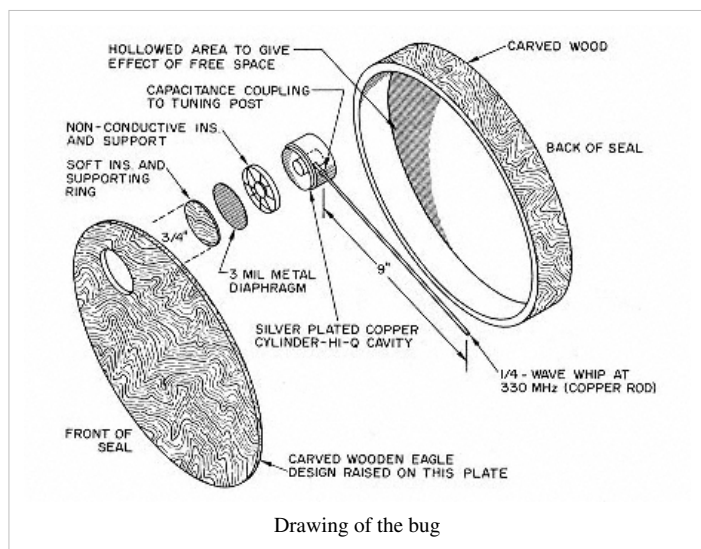
unless it was actively being irradiated remotely. These same design features, along with the overall simplicity of the device, made it very reliable and gave a potentially unlimited operational life.

## Use in espionage

Theremin's device was used by the Soviet Union to spy on the United States. The device was embedded in a carved wooden plaque of the Great Seal of the United States. On August 4,

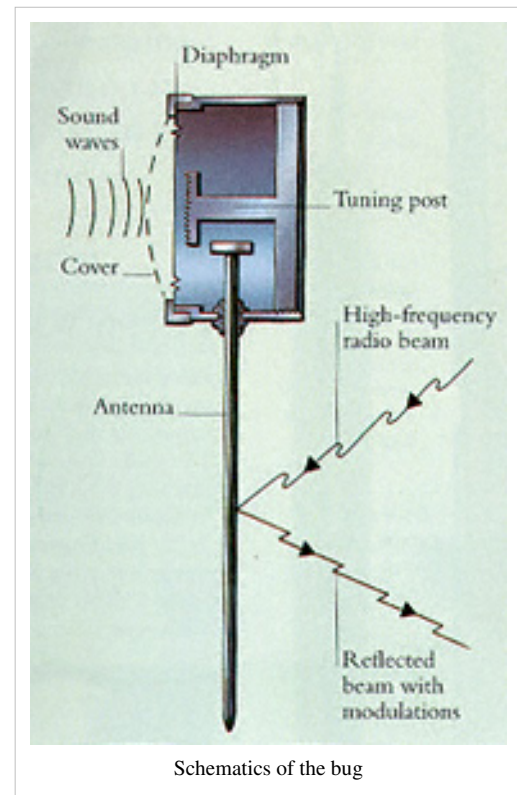


Replica of the Great Seal which contained a Soviet bugging device, on display at the NSA's National Cryptologic Museum.



1945, a delegation from the Young Pioneer organization of the Soviet Union presented the bugged carving to U.S. Ambassador Averell Harriman, as a "gesture of friendship" to the USSR's World War II ally. It hung in the ambassador's Moscow residential study until it was exposed in 1952 during the tenure of Ambassador George F. Kennan.<sup>[3]</sup> The existence of the bug was accidentally discovered by a British radio operator who overheard American conversations on an open radio channel as the Russians were beaming radio waves at the ambassador's office. The Department of State found the device in the Great Seal carving after an exhaustive search of the American Embassy, and Peter Wright, a British scientist and former MI5 counterintelligence officer, eventually discovered how it worked.<sup>[4] [5]</sup> Had the device never been discovered, it could easily have worked for 50 years or more.

The membrane of the Thing was extremely thin, and was damaged during handling by the Americans; Wright had to replace it. Wright's examination led to development of a similar British system codenamed SATYR, used throughout the 1950s by the British, Americans, Canadians, and Australians.<sup>[4]</sup>



## United Nations

On the fourth day of meetings in the United Nations Security Council, convened by the Soviet Union over the 1960 U-2 incident where a U.S. spy plane had entered their territory and been shot down, the US ambassador showed off the bugging device in the Great Seal to illustrate that spying incidents between the two nations were mutual and to allege that Nikita Khrushchev had magnified this particular incident under discussion out of all proportion as a pretext to abort the 1960 Paris Summit.<sup>[6]</sup>

## Notes

- [1] *Hacking Exposed Linux: Linux Security Secrets & Solutions* (third ed.). McGraw-Hill Osborne Media. 2008. pp. 298. ISBN 978-0-07-226257-5.
- [2] Glinisky, Albert, *Theremin: Ether Music and Espionage*, University of Illinois Press, Urbana, 2000
- [3] George F. Kennan, *Memoirs, 1950-1963, Volume II* (Little, Brown & Co., 1972), pp. 155, 156
- [4] Murray, Kevin. "THE GREAT SEAL BUG STORY" ([http://www.spybusters.com/Great\\_Seal\\_Bug.html](http://www.spybusters.com/Great_Seal_Bug.html)). . Retrieved 2007-03-24.
- [5] Davis, Henry. "Eavesdropping using microwaves - addendum" (<http://www.audiodesignline.com/howto/173602214>). . Retrieved 2007-03-24.
- [6] United Nations Security Council Report *meeting 860* ([http://www.undemocracy.com/S-PV-860/page\\_15/rect\\_155,148\\_530,482/rect\\_453,130\\_530,148](http://www.undemocracy.com/S-PV-860/page_15/rect_155,148_530,482/rect_453,130_530,148)"Verbatim) page 15 on 26 May 1960 (retrieved 2008-08-29)

## References

- Wright, Peter (1987). *Spycatcher: The Candid Autobiography of a Senior Intelligence Officer*. New York: Viking. ISBN 0-670-82055-5.
- Kennan, George (1967). *Memoirs, 1925-1950*. Little, Brown.
- Kennan, George (1983). *Memoirs: 1950–1963*. Pantheon. ISBN 978-0394716268.

## External links

- Passive Resonant Cavity & "Spycatcher" Technical Surveillance Devices (<http://servv89pn0aj.sn.sourcedns.com/~gbpprorg/mil/cavity/index.html>)
  - Security Management (website) - A Trojan Seal (<http://www.securitymanagement.com/print/6971?page=0,2>), Ken Stanley, April 2010
-

# Article Sources and Contributors

**Thing (listening device)** *Source:* <http://en.wikipedia.org/w/index.php?oldid=420240521> *Contributors:* Bdkives, Bilsonius, Blooy, Calvados, Carptrash, David spector, Excirial, F, Ferko7, Finell, FuegoFish, Goatchurch, Lambiam, Mauls, Mikebar, Nabokov, Ninly, NonNobisSolum, OlEnglish, Olegwiki, Pmussler, Reyals, Sagaciousuk, Shaddack, Shpakovich, Tec15, Throwaway85, 31 anonymous edits

# Image Sources, Licenses and Contributors

**Image:Bugged-great-seal-open.jpg** *Source:* <http://en.wikipedia.org/w/index.php?title=File:Bugged-great-seal-open.jpg> *License:* Creative Commons Attribution-Sharealike 2.0 *Contributors:* Austin Mills

**Image:Great-Seal-Bug-Exploded.jpg** *Source:* <http://en.wikipedia.org/w/index.php?title=File:Great-Seal-Bug-Exploded.jpg> *License:* Public Domain *Contributors:* Acquris, Clindberg, Mdd

**Image:Great-Seal-schematic.jpg** *Source:* <http://en.wikipedia.org/w/index.php?title=File:Great-Seal-schematic.jpg> *License:* Public Domain *Contributors:* Acquris, Clindberg

# License

---

Creative Commons Attribution-Share Alike 3.0 Unported  
<http://creativecommons.org/licenses/by-sa/3.0/>