

# Hedy Lamarr - ekstaza tajnej komunikacji

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## Streszczenie

Hedy Lamarr (właściwie Hedwig Eva Maria Kiesler) (1914-2000) – aktorka pochodzenia austriackiego, w roku 1932 zagrała w czechosłowacko-niemieckim filmie "Ecstasy" w reż. Gustava Machatego. Film będący naiwną historią młodej nieszczęśliwej kobiety, zawiera pierwszą „nagą scenę” w historii kinematografii. Po ucieczce z opanowanej przez nazizm Austrii osiedla się w Stanach Zjednoczonych. 11 sierpnia 1942, wraz z pianistą i kompozytorem Georgem Antheilem, opatentowała system tajnej komunikacji służący naprowadzaniu drogą radiową torped (U.S. Patent 2,292,387 – *Secret Communications System*). Wynaleziona przez Hedy Lamarr i George’a Antheila technika komunikacji nosi nazwę frequency hopping i jest obecnie powszechnie używana w sieciach bezprzewodowych, w tym GSM, IEEE 802.11 FHSS.

Celem referatu jest przedstawienie biografii Hedy Lamarr, zarówno jako aktorki, ale też jako matki współczesnych technik bezprzewodowych, których rodowód wywodzi się z wynalazku związanego z tajną komunikacją.

# Hedy Lamarr - ekstaza tajnej komunikacji

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VIII Krajowa Konferencja Zastosowań Kryptografii Enigma 2004  
Warszawa, 10-13 maja 2004

## Główne punkty prezentacji



Źródło: [1]

- ◆ Dzieciństwo i wczesna młodość
- ◆ Pierwszy głośny film: Ekstaza
- ◆ Pierwszy mąż: Fritz Mandl i jego wpływ na życie Hedy Lamarr
- ◆ Pozostałe 5 małżeństw Hedy
- ◆ Pozostałe filmy: pełna filmografia
- ◆ Wynalazek – system tajnej komunikacji  
- jego zastosowania i wpływ na współczesne sieci bezprzewodowe

# Hedwig Eva Maria Kiesler



Źródło: [5]

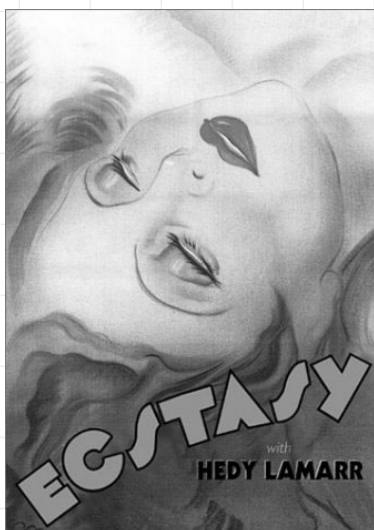
- ◆ Hedy Lamarr (właściwie Hedwig Eva Maria Kiesler)
- ◆ Urodzona (najprawdopodobniej) 9 listopada 1914 w Wiedniu
- ◆ ojciec Emil – bankowiec, matka Gertruda - pianistka
- ◆ pod koniec lat 20. rozpoczyna prace w teatrach berlińskich dzięki pomocy Maxa Reinhardta
- ◆ wraca do Wiednia na początku lat 30.
- ◆ 1931: Pierwsza istotna rola w filmie "Man braucht kein Geld" – wraz z Hansem Moserem i Heinzem Rühmannem

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## Ekstaza



Źródła: [3], [11]

- ◆ 1933: "Ecstasy" („Ekstaza”) – czechosłowacko-niemiecki film; reż. Gustav Machaty
- ◆ historia młodej nieszczęśliwej kobiety (Evy) mającej za męża starszego mężczyznę; Eva zakochuje się w Adamie młodym, pełnym życia mężczyźnie
- ◆ Pierwsza „naga scena” w historii kinematografii

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# Pierwszy mąż: Fritz Mandl



Źródło: [3]

- ◆ 10 sierpnia 1933 Hedy Kiesler wychodzi za mąż za austriackiego przemysłowca Fritza Mandla, szefa Hirtenberger Patronenfabrik, jednego z największych wytwórców broni
- ◆ Nieudane małżeństwo
- ◆ Zaprzestanie kariery aktorskiej
- ◆ Środowisko nazistowskie
- ◆ Po rozwodzie (1937) przeprowadza się do Londynu, a następnie do Hollywood
- ◆ Na statku do Stanów spotyka Louisa B. Mayera (MGM), z którym podpisuje kontrakt
- ◆ Zmienia nazwisko na Lamarr (morze) – podobne do nazwiska gwiazdy kina niemego Barbary La Marr

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# Pozostałe małżeństwa Hedy

"Perhaps my problem in marriage - and it is the problem of many women – was to want both intimacy and independence. It is a difficult line to walk, yet both needs are important to a marriage."

## ◆ Małżeństwa

- ◆ Fritz Mandl, przemysłowiec (ślub 1933 – rozwód 1937)
- ◆ Gene Markey, pisarz (ślub 1939 – rozwód 1940)
- ◆ John Loder, aktor (ślub 1943 – rozwód 1947)
- ◆ Teddy Stauffer, muzyk (ślub 1951 – rozwód 1952)
- ◆ W. Howard Lee, milioner (ślub 1953 – rozwód 1960)
- ◆ Lewis J. Boies, prawnik (ślub 1963 – rozwód 1965)

## ◆ Dzieci (z Johnem Loderem): James (adoptowany), Anthony i Denise

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# Filmografia Hedy

"Entertaining the Troops" (1989)  
 "That's Action" (1977)  
 "The Love Goddesses" (1965)  
 "The Female Animal" (1957)  
 "The Story of Mankind" (1957)  
 "I Cavalieri dell'illusione" (1954)  
 "L'Amante di Paride" (1953)  
**"My Favorite Spy" (1951)**  
 "Copper Canyon" (1950)  
 "A Lady Without Passport" (1950)  
**"Samson and Dalilah" (1949)**  
 "Let's Live a Little" (1948)  
 "Dishonored Lady" (1947)  
 "The Strange Woman" (1946)  
 "Her Highness and the Bellboy" (1945)  
 "Experiment Perilous" (1944)  
 "The Conspirators" (1944)  
 "The Heavenly Body" (1943)  
 "Show Business at War" (1943)  
 "Tortilla Flat" (1942)  
 "Crossroads" (1942)  
 "White Cargo" (1942)  
 "Come Live with Me" (1941)  
 "Ziegfeld Girl" (1941)  
 "H.M. Pulham, Esq." (1941)  
 "Boom Town" (1940)  
 "Comrade X" (1940)  
 "The Miracle of Sound" (1940)  
 "I Take This Woman" (1939)  
 "Lady of the Tropics" (1939)  
 "Algiers" (1938)  
**"Ecstasy" (1933)**  
 "Die Koffer des Herrn O.F." (1931)  
 "Die Blumenfrau von Lindenau" (1931)  
 "Man braucht kein Geld" (1931)  
 "Geld auf der Straße" (1930)



Źródło: [1]

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## 1998: Hedy vs. Corel

**Corel Caught Digging for Dirt**  
 Polly Sprenger | Also by this reporter  
 12:05 PM Nov. 04, 1998 PT

Hedy Lamarr, the 84-year-old actress from Longwood, Florida, is locked in an unpleasant court battle with Corel Corp, the Canadian software publisher that owns WordPerfect.

Hedy Lamarr sued the Ottawa, Ontario-based software company in March for allegedly using her name and likeness on the packaging of its CorelDraw8 software without her permission.

Last Friday, Lamarr's lawyer went before the US District Court court in Orange County Florida. He demanded an injunction against the company, insisting that Corel remove the actress's name and image from its product packaging until the suit is settled.

Corel's lawyers argued that Lamarr's likeness is worth less than the actress imagines. The company said in court that she had a criminal past that included two shoplifting incidents and a false rape charge in 1971.

Michael McDonnell, Lamarr's lawyer, scoffs at Corel's allegations.

"I think they were looking for a way to slime her," McDonnell said.

"One time, Miss Lamarr was in a store, and paid for one thing, and walked out with another. It was just a mistake."

McDonnell says the Corel lawyers were using information from a 1966 biography of Lamarr called *Ecstasy and Me: My Life as a Woman*, by Samuel Post. He characterized the unauthorized biography as "trashy."

The McGraw-Hill Company is also named in the suit. The Manhattan-based publishing company produces instructional materials for CorelDraw8.

McGraw-Hill has allegedly argued that Lamarr is legally b likeness have been so widely distributed, the *Orlando Bu*



Źródło: [1]



<http://www.wired.com/news/politics/0,1283,16042,00.html>

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# Wynalazek

The New York Times.

HEDY LAMARR INVENTOR

Actress Devises 'Red-Hot' Apparatus for Use in Defense

Special to THE NEW YORK TIMES.  
HOLLYWOOD, Calif., Sept. 30.—Hedy Lamarr, screen actress, was revealed today in a new role, that of an inventor. So vital is her discovery to national defense that government officials will not allow publication of its details.

Colonel L. B. Lant, chief engineer of the National Inventors Council, classed Miss Lamarr's invention as in the "red hot" category, only inking of what it was the announcement related to remote apparatus employed in



Źródło: [3]

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♦ 1942 – wywiad dla Associated Press :

„Any girl can be glamorous. All you have to do is stand still and be stupid”

♦ Radiowy system sterowania torpedami

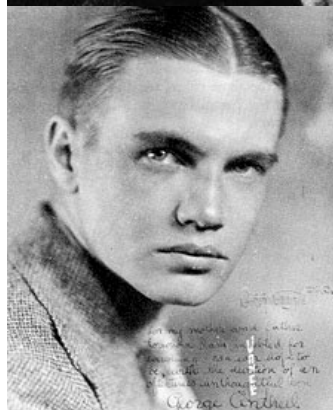
♦ Frequency hopping

♦ U.S. Patent 2,292,387 – Secret Communications System - (11 sierpnia 1942) wraz z Georgem Antheilem

## George Antheil (1900-1959)

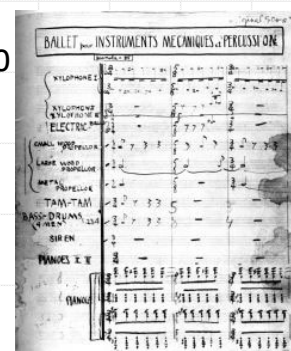


a)



b)

- ♦ Ekscentryczny kompozytor
- ♦ Pierwszy twórca mechanicznej muzyki *Ballet pour instrument mécaniques et percussion*, znanego jako *Ballet mécanique* – por. źródło [8]
- ♦ Jedna z pierwszych wersji z 1924: 16 fortepianów, cztery bębny basowe, trzy ksylofony, tam-tam, siedem elektrycznych dzwonów, syrena, trzy śmigła samolotowe oraz „dwóch żywych pianistów”



c)

"In the future, composers would prefer to compose for machines rather than for people, because the machines would be more predictable, and offer a wider range of sound"

Źródła: a) [6]; b), c) [7]

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# Technika Spread Spectrum

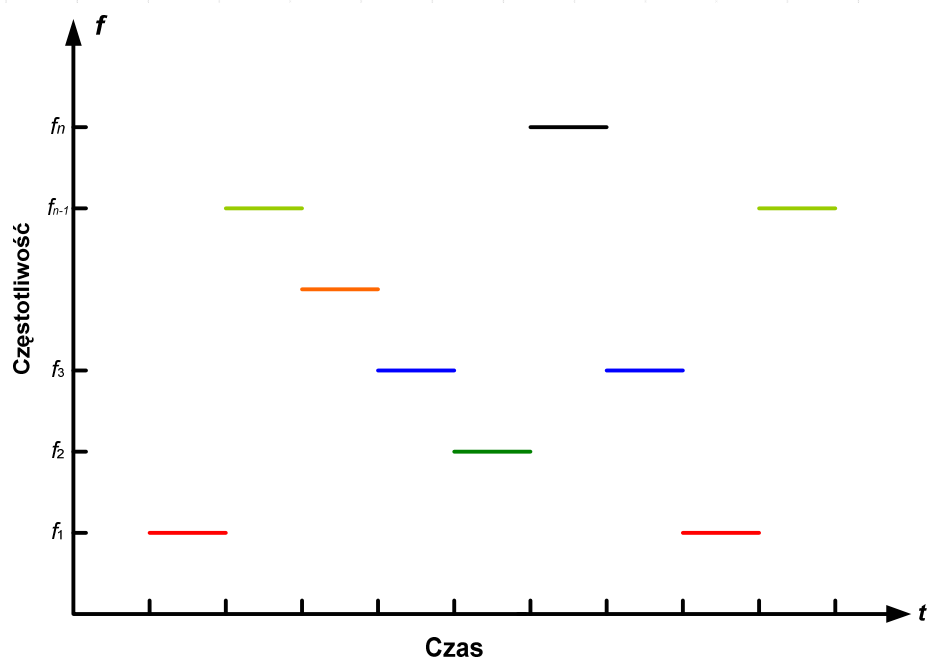
- ◆ Zamiast transmitować sygnał na pojedynczej częstotliwości – użyte jest wiele częstotliwości
- ◆ Dwa podejścia
  - ◆ Frequency hopping (Hedy Lamarr i George Antheil - 1942)
    - ◆ Generator pseudolosowy wskazuje, której użyć częstotliwości
  - ◆ Direct Sequence
    - ◆ Każdy symbol jest rozprzestrzeniany na wielu częstotliwościach
    - ◆ Np. IEEE 802.11b (dla przepływności 1/2 Mbit/s) używa kodu Barker'a:  
> +1 -1 +1 +1 -1 +1 +1 -1 -1 -1
    - ◆ Jeśli ma być wysłana 1, wtedy  
> +1 -1 +1 +1 -1 +1 +1 -1 -1 -1 jest wysyłane do modulatora
    - ◆ Jeśli 0:  
> -1 +1 -1 -1 +1 -1 -1 -1 +1 +1 +1

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## Frequency Hopping (FH)



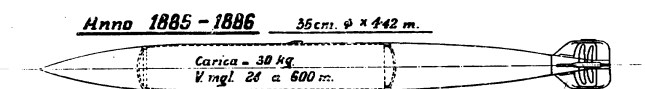
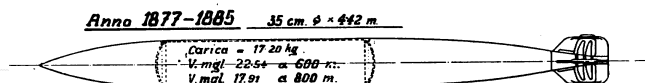
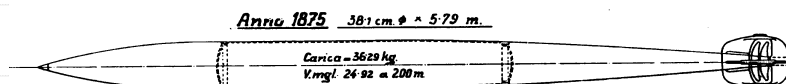
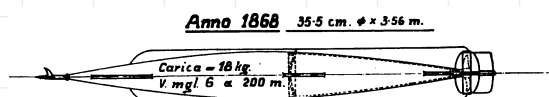
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# Torpedy

- ♦ pocisk podwodny, w kształcie wydłużonego cygara
- ♦ 1866 – Robert Whitehead – ulepszona mina wytykowa



Źródło: [13]

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# Wynalazek nr 2,292,387

Patented Aug. 11, 1942

2,292,387

## UNITED STATES PATENT OFFICE

2,292,387

### SECRET COMMUNICATION SYSTEM

Hedy Kiesler Markey, Los Angeles, and George Anthell, Manhattan Beach, Calif.

Application June 10, 1941, Serial No. 397,412

6 Claims. (Cl. 250—2)

This invention relates broadly to secret communication systems involving the use of carrier waves of different frequencies, and is especially useful in the remote control of dirigible craft, such as torpedoes.

An object of the invention is to provide a method of secret communication which is relatively simple and reliable in operation, but at the same time is difficult to discover or decipher.

Briefly, our system as adapted for radio control

Fig. 2 is a schematic diagram of the apparatus at a receiving station;

Fig. 3 is a schematic diagram illustrating a starting circuit for starting the motors at the transmitting and receiving stations simultaneously;

Fig. 4 is a plan view of a section of a record strip that may be employed;

Fig. 5 is a detail cross section through a record-responsive switching mechanism employed in

Źródło: [9]

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Aug. 11, 1942.

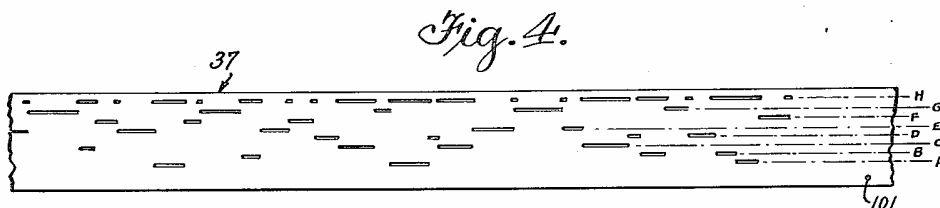
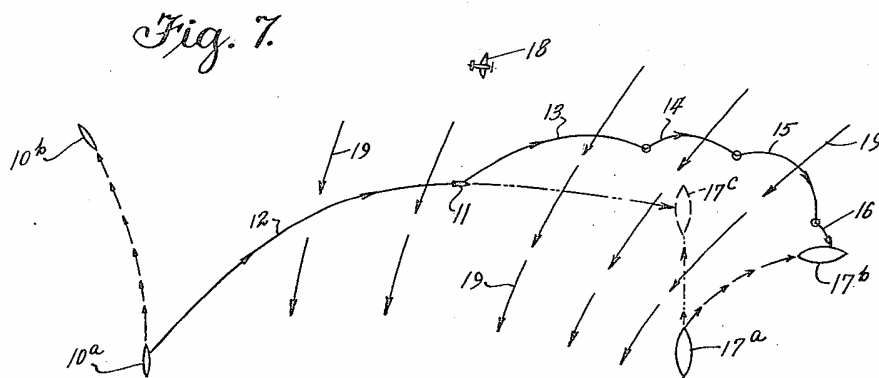
H. K. MARKEY ET AL

2,292,387

SECRET COMMUNICATION SYSTEM

Filed June 10, 1941

2 Sheets-Sheet 2



Źródło: [9]

Zmiana kursu torpedy przy użyciu wynalazku (Fig. 7) i taśma synchronizująca (Fig. 4)

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Aug. 11, 1942.

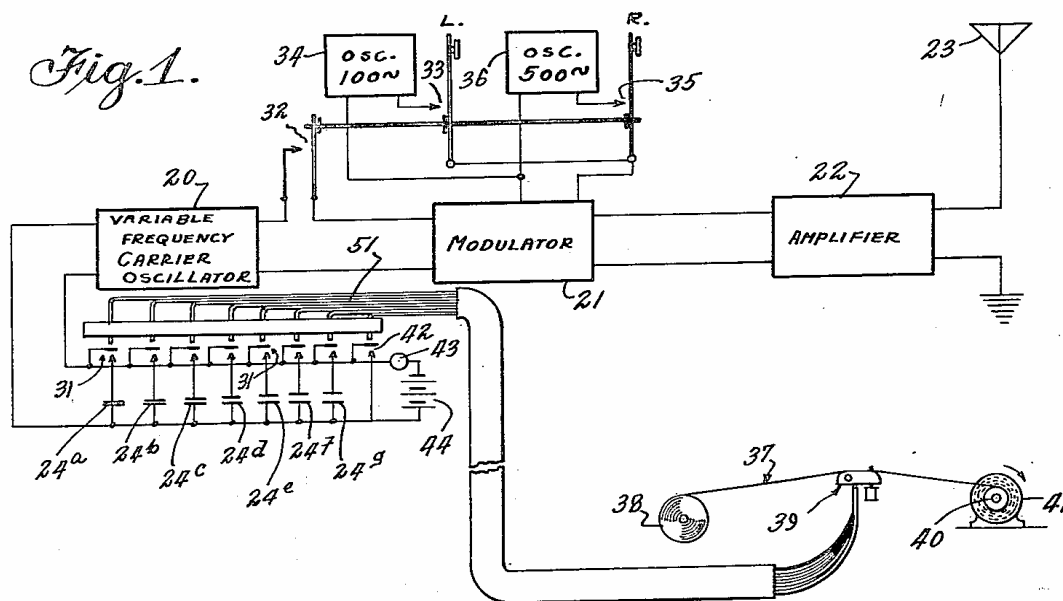
H. K. MARKEY ET AL

2,292,387

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Filed June 10, 1941

2 Sheets-Sheet 1



Schemat nadajnika (Fig. 1)

Źródło: [9]

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# Tanzystor: 1947/8



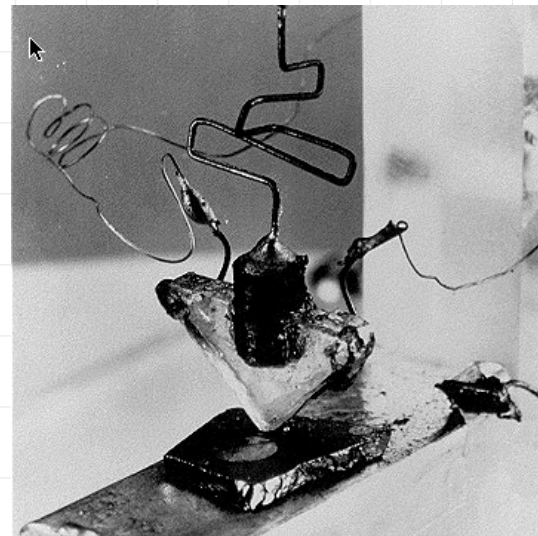
William Bradford Shockley



Walter Houser Brattain



John Bardeen



„The sandwich transistor”

Źródło: [14]

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# Pierwsze użycie FH: kryzys na Kubie (16-28.10.1962)

SENSITIVE  
20 February 1962  
Program Review  
by Brig. Gen. Lansdale

## THE CUBA PROJECT

The Goal. In keeping with the spirit of the Presidential memorandum of 30 November 1961, the United States will help the people of Cuba overthrow the Communist regime from within Cuba and institute a new government with which the United States can live in peace.

The Situation. We still know too little about the real situation inside Cuba, although we are taking energetic steps to learn more. However, some salient facts are known. It is known that the Communist regime is an active Sino-Soviet spearhead in our Hemisphere and that Communist controls inside Cuba are severe. Also, there is evidence that the repressive measures of the Communists, together with disappointments in Castro's economic dependency on the Communist formula, have resulted in an anti-regime atmosphere among the Cuban people which makes a resistance program a distinct and present possibility.

Time is running against us. The Cuban people feel helpless and are losing hope fast. They need something they can join with the hope of starting to work surely towards overthrowing the regime. Since late November, we have been working hard to re-orient the operational concepts within the U.S. government and to develop the hard intelligence and operational assets required for success in our task.

The next National Intelligence Estimate on Cuba (NIE 85-62) promises to be a useful document dealing with our practical needs and with due recognition of the sparsity of hard facts. The needs of the Cuba project, as it goes into operation, plus the increasing U.S. capability for intelligence collection, should permit more frequent estimates for our guidance. These will be prepared on a periodic basis.

Premises of Action. Americans once ran a successful revolution. It was run from within, and succeeded because there was timely and strong political, economic, and military help by nations outside who supported our cause. Using this same concept of revolution from within, we must now help the Cuban people to stamp out tyranny and gain their liberty.

On 18 January, the Chief of Operations assigned thirty-two tasks to Departments and Agencies of the U.S. government, in order to provide a realistic assessment and preparation of U.S. capabilities. The Attorney General and the Special Group were apprised of this action. The answers received on 15 February provided the basis for planning a realistic course of action. The answers also revealed that the course of action must contain continuing coordination and firm overall guidance.

The course of action set forth herein is realistic within present operational estimates and intelligence. Actually, it represents the maximum target timing which the operational people jointly considered feasible. It aims for a revolt which can take place in Cuba by October 1962. It is a

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Źródło: [10]



"All right, Mr President, we are willing to negotiate."

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# Zastosowania FH

- ◆ Milstar
- ◆ GSM
- ◆ IEEE 802.11 FHSS



Źródło: [12]

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Hedy zmarła 19 stycznia 2000 w Orlando na Florydzie; jej prochy spoczęły w Wiedniu

Films have a certain place  
in a certain time period.  
Technology is forever.  
Hedy Lamarr

Źródło: [1]

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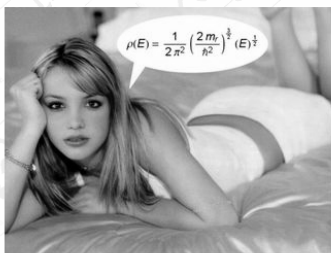


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- [4] <http://www.hedylamarr.com/>
- [5] <http://www.hedylamarr.org/>
- [6] [http://www.bluetoothnews.com/hedy\\_lamarr\\_story.htm](http://www.bluetoothnews.com/hedy_lamarr_story.htm)
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- [9] <http://www.uspto.gov/>
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- [14] [http://uk.geocities.com/magoos\\_universe/transistor.htm](http://uk.geocities.com/magoos_universe/transistor.htm)



Źródło: [1]

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