

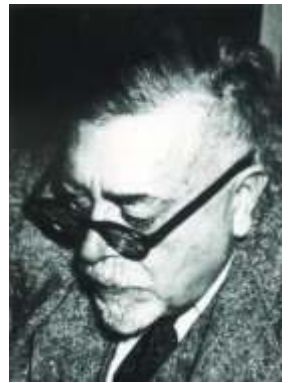
# 1.

## 1.1.

“ ”

INFORMATION ( ) (Philippe Dreyfus) 1962. autoMATIQUE ( ) (informatio).

(Norbert Wiener, 26.11.1894. - 18.03.1964)



- 
- 
- 
- 

(Claude Elwood Shannon, 30.3.1916. – 24.2.2001.).



## 1. 2.

## 1. 3.

( 1450. 1840. 1940. ),  
( 1450. 1840. 1940. )  
( 1840. 1940. )

( 1450. ),

(+, -, \* /).

3000.

2000.

2600.

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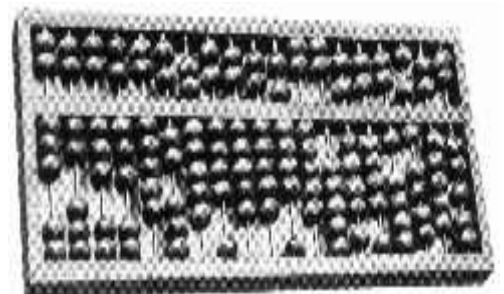
150

875.

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*abakion* - 300.  
)



(Abu Abdulah Muhamed ibn Musa Al

Horezm, oko 800-850.)

( 1450. 1840. )

1588.

, 1594.

(John Napier,

1550-1617. ),



( , )

(William Oughtred,

(Edmund Gunter, 1581-1626.).

1574-1660.) 1622.

(Wilhelm Schickard, 22.4.1592-24.10.1635.) 1623/24.



(Blaise Pascal, 19.6.1623.-19.8.1662.)



1642.

1652.

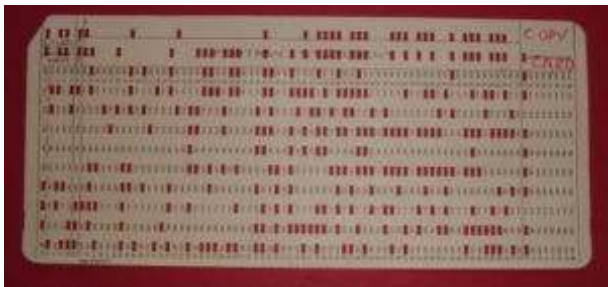
, 1673.

(Gottfried Wilhelm Freiherr baron von Leibniz, 1.7.1646.-14.11.1716. godine).



(Joseph-Marie Jacquard,

1752-1834.) 1801.



1806.

" "

(Charles Babbage, 26.12.1791.-18.10.1871.), 1822.



8

15

25.000

$$a + bx + cx^2 + dx^3 + ex^4 + fx^5 + gx^6$$

*Differnece engine*

No. 2.

1991.

(London Science Museum)

31

1989.



(loops of Jacquard's)



Countess of Lovelace, 10.12.1815.- 27.11.1852.),

( )

(Lady Ada Augusta Byron,



( 1840. 1940. )

(Herman Hollerith, 29.2.1860.-17.11.1929.)

- 1890.

(

1896.

).



1911.  
 (CTR).  
**IBM** (*International Business Machine*).  
 1930. 1940.

**Computing Tabulating Recording Corporation**  
 (Thomas J. Watson), 1924.

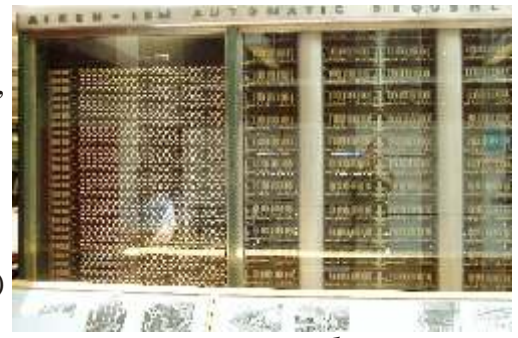
Z1 1936.  
 Z2, 800  
 Z2 600  
 Z3 1.800  
 1939. 1941.

(Konrad Zuse).

**Harvard Mark I.**

( )  
 I  
 (Howard Aiken)  
 1944., 15

(James W. Bryce)



(Colossus)  
 (Tommy Flowers)  
 (Max Newman)  
 (Dollis Hill),  
 (Bletchley Park),

1943.

I,  
 1944.

II, 10



(Turing-complete)  
 Turing; 23.6.1912.—7.6.1954.),

(Alan Mathison)

(Atanasoff-Berry Computer),

I

Z3

30-

1930. (Vannevar Bush).  
(1800),

*Differnece engine No. 2* ( ), 1991.

*Small Scale*

*Expermental Machine* ( ), 1948.  
, 1945.  
(ohn von Neumann,

*Margittai Neumann Janos Lajos*,



### 1.4.

William Mauchly) - 1946. (John Presper Eckert) (John  
(ENIAC - Electronic Numerical Integrator And Computer ),



.E

5. 1943. PX  
500 000 1943. 14. 1946.  
, 9. 1946. 29.  
23:45 2. 1947. 1955.  
1946.

(Honeywell, Inc. v. Sperry Rand Corp., et al.),

17468 , 7.200 , 1.500 , 70.000 , 10.000  
(2.4 ) 5 3 (0.9 ) 100 (30 ) , 27 , 8  
) 150 kW . 5.000 1800 (167

IBM , IBM  
( ring counter) , IBM 405. ENIAC ( - )  
( 36 " " ,

( . , 10 ) 5.000 ENIAC ' 20 ,

385 . ENIAC ,

9 ENIAC - ( " " ) , ( IBM

(Kite Sharpless) ( Jack Davis) ( ) , (Bob Shaw) ( ) , (Arthur Burks) ( ) , (Chuan Chu) ( / ) , (Harry Husky) ( / ) ,  
(Rojas & Hashagen)

200 , ENIAC 5.000

10 - d - ( d 10) d+4 , 10 -  
10 - 14 , 2800 - , 357 , 13(d+1) , d  
( ) . 143 , 28600

ENIAC  
ENIAC-

1948.

10%

1989.

15

“1954.”  
ENIAC -

116 ( )

1997. *Women in Technology International Hall of Fame.*

(*Kay McNulty*),  
(*Ruth Lichterman*).

(*Betty Jennings*),

(*Betty Snyder*),

(*Marlyn Wescoff*),

(*Fran Bilas*)

UNIVAC . ENIAC

, BINAC, 1949.

1950.  
1943.

EDVAC, EDSAC i SEAC.

1948.,  
ROM,

- 5, 7, 9 - 14, 17 - 19)  
16. 1948.,

(*Adele Goldstine*)

I/O

1953.,

100

I/O

, excess-3

, ENIAC

( 10.000 20.000 );

1958.

“ ”

, 1948.

*Bell Telephone Laboratories* ( & )



I

( - ),

1950/51.

UNIVAC I (*UNIVersal Automatic Computer*),  
(*Lyons Electronic Office*)

1952.



I

701.

1953.

(*John Backus*, 3.12.1924-17.3.2007.) ,  
, (*FORmula TRANslation*)

, 1954.

**TRADIC** (*TRANisitor DIGital Computer*),  
1955. *Bell Telephone*

*Laboratories*,  
1958/59.

1963.



(*COmmon Business-Oriented Language*),

1959.

( 100.000 ; );

1960/61. , 1964.

360

1965.

8

1967.

1.000.000

(

);

1970.

*Univac 9700.*

370,

*Sperry-Univac*

1971.

(*Marcian "Ted" Hoff*).

16-

15.11.1971.,

I 4004 je

4

je

2250

60.000

I 8008,

1975.

40

I 8080 (

), Z 8000 (

6800 (

) 6502 (

S Technology).



8800

(*Micro Instrumentation and Telemetry*

1975.

8080,

256

*Systems*)

*Altair 8800.*

650

395

300.000

(*Edvard Roberts*).



- *The Computer Store*

(*Dick Heiser*).

(*Paul Allen*)

(*William Henry Gates III*)

(*Beginner's All Purpose Symbolic Instruction Code*).

(*Microsoft*)

BASIC

1976. (Wayne Green)  
 Apple  
 (Stephen (Steve) Gary "Woz" Wozniak) (Steven  
 Paul Jobs).

**Apple I.**  
 (Micropolis) 1977.  
 5 (Chuck Peddle) 8  
**Commodore**  
*International* w  
**PET**

**2001** ( ) 4 14  
 595  
 (Tandy)  
**Tandy Radio Shack**  
 80 1 4 599,95  
 1978. 8086, 80,  
 68000.

(VLSI) 1979.  
 20 40 100.000  
 2.250.000  
 12.23 4.78

(Ser Clive Marles Sinclair) 1980.  
**ZX 80** 100  
 4  
**Tandy**

**Radio Shack**  
**Shugart** 1  
 5 (30 ), x 16-30  
 1.200  
**Star** 8010. X R X

(mouse pointing device)  
 1981. ZX 81 69

**Commodore** VIC-20. **Osborne**  
**OSBORNE I** 1.500  
 X-20.  
 (Acorn) **I 8086**  
 1982. **BBC/Electron.**  
 48.

**YPR** ) **Non Linear Systems** (  
**Computer Corp.** **ycomp II** 9-  
**Business Machines Inc.** **Columbia**  
**Commodore 64**  
 6510, 64 20  
 595 200



1



2001



80 4



ZX 80



1



1



48



64

8086 8088.  
**IBM PC XT**  
 10  
 128

**Information Systems  
 Comp. Shugart Corp.**  
 7.600

. **Canon**  
**Windows**  
 . **Borland International Inc.**  
 8086.

1984  
**QL**  
 399  
 (Macintosh)  
**Instruments USA Inc.**

**Wirstw tch computer**  
 ,2 64  
**Hewlett-Packard Comp.**  
 1-2-3  
 M 68000 32- M 68020. **Commodore**

80286, 256 ,1,2  
 5.469  
 (LAN).  
 1986.  
**Microvax,**  
**PC RT, Hewlett-Packard**  
**Vectra**

(Very Large Scale Integration)  
 2.000.000 2.000.000.000  
 ;

64- 128-

80186 80286

**IBM PC**

4.995  
**Microsoft Multi-tool Word, &  
 Unix V. Hewlett-Packard  
 TouchScreen Computer.**  
 1



**PC XT**  
 2.000



**QL**

**Amiga**  
**Amiga 500.**  
**IBM PC AT**  
**PC Network**



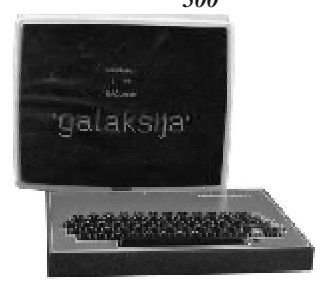
**110**

**IBM**  
**APC IV.**  
 - 4,5 6.



**500**

1985.



**3300**



# 1.5.

1950-1960. 1964, -20 “ -10 1960. ”, -22 1967. -12, -2, -200, 1970- ( 800, -11/34) 1980- 8, 32 64, 1980- : ZX, 64 .) ( -3 . 1983. 8.000 , 202. ( ) 1980- IBM PC IBM PC “ ” 1990- 1989. 1996. “ ” “ ” “ ”





## 2. 5.

## 2. 6.



*power*

*reset*

## 2.7.

(motherboard).



Random Access Memory)

## 2. 8.

(Central Processing Unit - CPU,

20.

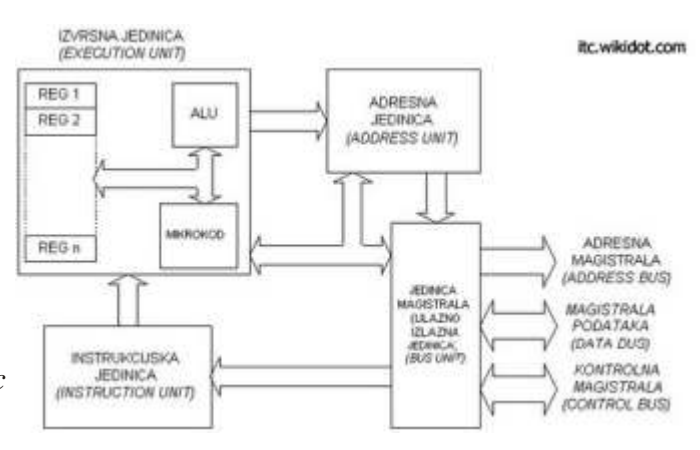
- 
- 
- 
- 
- 

(Control Unit),

(Execution Unit),

(Logic Unit),

(ALU - Arithmetic



( , ...).

( , , , ...).

( )

interrupt)

( 1972.

- ( *SISD* - Single Instruction Single Data).
- ( *SIMD* - Single Instruction Multiple Data)
- ( *MIMD* - Multiple Instruction Multiple Data)
- ( *MISD* - Multiple Instruction Single Data)

( *CISC* - Complex Instruction Set Computer).

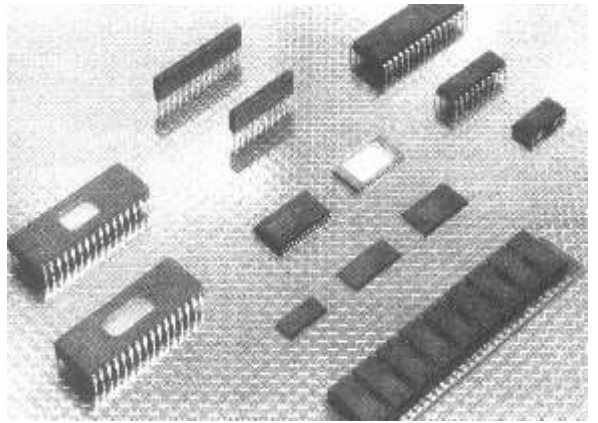
6600, y /360, X, -11 ) 80x86 68000.

( *RISC* - Reduced Instruction Set Computer).

( 80 8- , 68000 16- ) ( 4004 4-

## 2. 9.

- ( , , );
- ( , , );
- ( , - );
- ( , , ).



(RAM - *Random Access Memory* -

(*EPROM, EEPROM, UVEPROM*).

- ROM - *Read Only Memory*)

(*PROM*),

(*Basic Input/Output System* - BIOS

CPU.

(*register file*).

## 2. 10.

## 2. 11.

( )



( )

. SVGA

( 500à).

## 2. 12.

/



, IDE

IDE

. SCSI

IDE

SATA



/ (input/output, - )

, / ,  
 / ( )  
 . 232  
 ( ).  
 , ,  
 ( )  
 8 )  
 ,  
 (Universal Serial Bus) , ( USB  
 232 )  
 IDE, SCSI, USB )  
 , 232, USB  
 ( , USB )  
 ,  
 . USB  
 ( , , )  
 ( . )  
 ,  
 USB ,  
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**2. 13.**

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 2.1, 5.1, 6.1 7.1  
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 " ( )"  
 " )".



*(Sound Blaster)*

## 2. 14.

56.600 ( ).

(Dial-up)

- , .
- , .



( ).



(LAN)

## 2. 15.



500 - 2.000.000



(1,44

(700 (CDR ).

CDRW

(DVDR, DVDRW)



(4.7 ),

(Blu-ray Disc)

128

32

25, 50 100

## 2. 16.





9, 12 24.

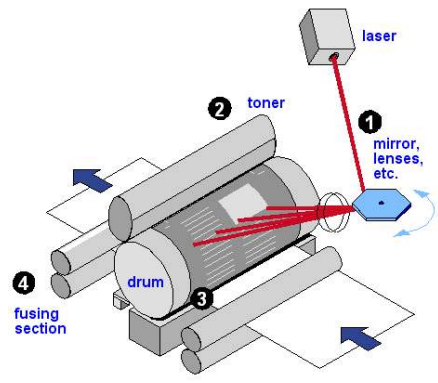
7,

200

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100

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420 )  
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840 ) 0 (840 1188 ) ,

3 (297

1 (594

( 4 3 ),



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9600 9600

50 50



(  
1, 2, 8, 16 32

(Uninterruptible Power Supply -



3 , 2

- ( )
- ( ).

( - ) - . ( ) ,  
 ( ) .

- 
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- 
- 

(Light Emitting Diode)



28

8.

(Cathode Ray Tube -



( )

( )

24

( ) .  
 (Red Green Blue)

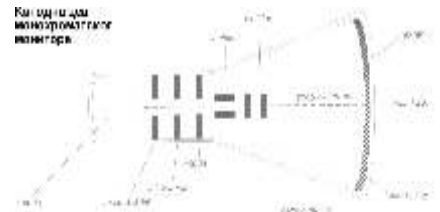
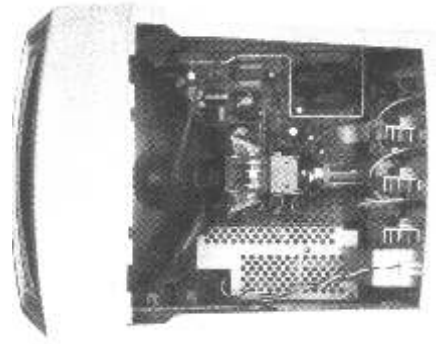
( : 200, 350 480

1024 768

600

800 600,

).



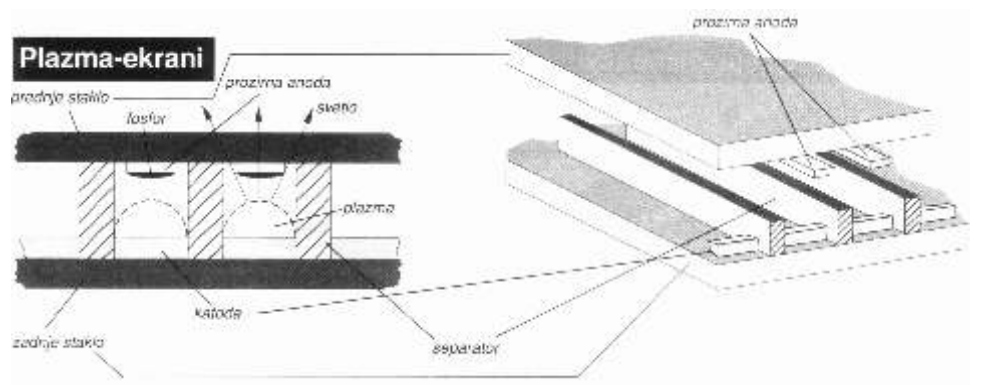
(Liquid Crystal Display)

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30



10-15 ).





web



2.000 5.000



subwoofer) 5.1



Web