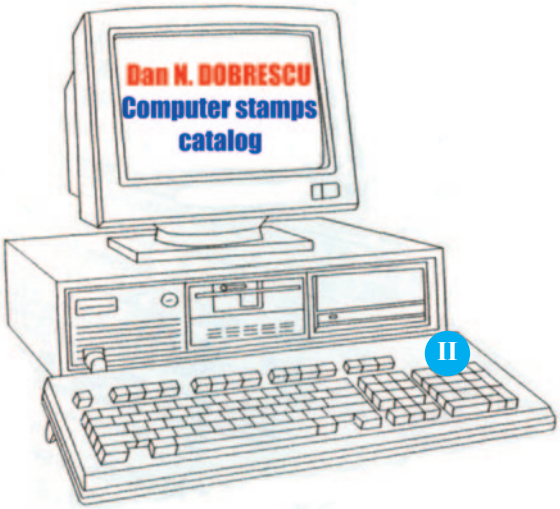

2020

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---------- Abacus

The most important forerunner to the modern day computer was a calculating tool invented before the birth of Prcist: the abacus. The abacus was invented in China about 2600 B.C. This consists of beads or disks that can be moved up and down on a series of sticks or strings within wooden frame. The abacus itself doesn't calculate; it's a simple device that helps falling by remembering what has been counted.

Calculation instrument represents, in its primitive form, a board covered with a layer of sand, on which lines were drawn with a sharp object. In the columns thus obtained, stones or other objects were placed in meaningful positions. In the ancient Rome, the abacus was called *calculi* or *abaculi* from which the words computers (to compute) and calculus (calculation) then derived. At the end of XV century, in Europe, a certain kind of abacus, known as abacus on lines, was widespread. This consisted of a lined board where the horizontal lines corresponded to units, tens, hundreds, etc., and the vertical lines signified different entities.

Pope Sylvester II (983-1003), developed a more complex abacus which allowed people to perform calculations more quickly.

Year	Country	Cat. No.
1938	Hungary	HU 01-02
1964	France	FR 12
1966	Netherland Antilles	NEA 01
1969	Egypt	EGY 01
1970	Cuba	CUB 03
1970	Mauritius	MAS 01
1971	Congo Democratic Rep.	CDR 02
1972	Australia	AU 03
1972	Surinam	SUR 01
1975	China, PR	PRC 02
1976	Burma	BUR 01
1976	China, PR	PRC 03
1977	Colombia	COL 03
1978	Albania	ALB 03
1979	Central African Republic	CEA 04
1979	China, Republic of	ROC 07
1980	Syria	SY 02
1982	Hungary	HU 13
1984	Bhutan	BHU 03
1987	Germany, FRG	FRG 12
1987	Japan	J 10
1988	Ireland	IRL 04
1991	Mexico	MEX 17
1991	South Africa - Venda	RSAV 03

---------- Catalog by categories A

1992	Paraguay	PAR 19
1995	Philippines	PH 06
1996	China, Republic of	ROC 26
1996	Egypt	EGY 04
1998	India	IN 07
1999	Liberia	LBR 01
1999	Great Britain	GB 16
1999	Slovenia	SLO 06
2000	China, Hong Kong	HK 16
2001	China, Macao	MAC 08
2002	China, Hong Kong	HK 22
2005	Israel	IL 34
2014	Philippines	PH 17

---------- Analogue computer

An ***analogue computer*** is a form of computer that uses the continuously-changeable aspects of physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved. In contrast, digital computers represent varying quantities incrementally, as their numerical values change.

Year	Country	Cat. No.
1967	Sweden	SWE 01
1977	Comoro Is.	COM 06
1988	Gambia	GAM 02
1993	Madagascar (Malagasy Republic)	MDG 09
1993	Yugoslavia	YU 11A
1995	Grenada	GRE 11
2006	Greece	GR 06
2007	Serbia	SRB 00
2009	Guinea Bissau	GUS 15
2018	Bosnia & Hertzegovina Serb Adm. Republlic of Srpska	BHS 06
2018	Serbia	SRB 07

---------- Artificial intelligence

Artificial intelligence (AI) is the intelligence of machines and the branch of computer science which aims to create it. John McCarthy, who coined the term in 1956, defines it as *the science and engineering of making intelligent machines*.

The field was founded on the claim that a central property of human beings, intelligence - the sapience of *Homo sapiens* - can be precisely described that it can be simulated by a machine.

The central problems of *AI* include traits as reasoning, knowledge, planning, learning, communication, perception and the ability to move and manipulate objects.

---------- Catalog by categories A

Year	Country	Cat. No.
2000	Palau	PAL 09
2016	San Marino	SAN 11

---------- Astrolabe

The astrolabe is a very ancient astronomical computer for solving problems relating to time and the position of the Sun and stars in the sky. Several types of *astrolabes* have been made.

By far the most popular type is the planispheric *astrolabe*, on which the celestial sphere is projected onto the plane of equator. A typical old *astrolabe* was made of brass and was about 6 inches (15 cm) in diameter, although much larger and smaller ones were made.

Year	Country	Cat. No.
1996	Syria	SY 07
1998	Uzbekistan	UZ 01
1999	Togo	TOG 10
2000	Guinea, Republic	GUR 08
2002	Portugal	POR 24
2006	Greece	GR 06

---------- Augmented reality

Augmented reality (**AR-code**) is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions by enhancing one's current perception of reality. By contrast, *virtual reality* replaces the real world with a simulated one. Augmentation is conventionally in real-time and in semantic context with environmental elements, such as sports scores on TV during a match. With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulable. *Artificial information* about the environment and its objects can be overlaid on the real world.

Year	Country	Cat. No.
2011	Netherland	NL 64
2011	USA	USA 73
2012	Canada	CAN 53-55

---------- Catalog by categories A-B

2012	Great Britain - Isle of Man	GBM 06
2013	Finland - Aland Is.	AL 04-05
2013	Denmark - Faroe Islands	FAR 09
2013	Denmark - Greenland	GRO 03
2013	France	FR 44
2013	Great Britain - Guernsey	GBG 09
2013	Great Britain - Jersey	GBJ 06
2013	Iceland	IC 09
2014	Liechtenstein	LIE 11
2019	Great Britain - Jersey	GBJ 07
2019	Greece	GR 17
2020	China, People's Republic	PRC 36

----- Automated Teller Machine (ATM)

ATM is a device used by bank customers to process account transactions a user inserts into the ATM a special plastic card (money card).

Year	Country	Cat. No.
1986	China, Republic of	ROC 12
1992	Algeria	ALG 04
1998	USA	USA 38
2000	Botswana	BOT 03
2001	Fiji	FJ 05
2015	Trinidad & Tobago	TRT 07
2015	Turkey	TU 21
2016	China, People's Republic	PRC 27A
2018	Ethiopia	ET 05
2020	Malaysia	MLY 37

-------- Banking services and solutions

Today no bank can succeed without computerization and on-line services. Almost everyone encounters computers in banks: automatic tellers and other personal banking machines are computerized and on-line. Most Postal Authorities have a bank - GIRO - which provide limited banking services, such as money transfers, various payments and saving accounts.

Year	Country	Cat. No.
1968	France	FR 13
1977	Singapore	SIN03-04
1986	China, Republic of	ROC 12
1986	Brazil	BZ 14
1988	Costa Rica	COR 02
1990	Thailand	THI 09
1992	Pakistan	PAK 03
1992	Tanzania	TAN 03
1997	China, Hong Kong	HK 10
2015	Estonia	EES 02
2015	Estonia	EES05
2016	India	IN 22

---------- Barcode

A ***barcode*** - the characters are represented by sets of parallel bars of varying thickness and separation. Several reading mechanisms exist, such as light pens and optical scanners.

Barcode as product identifier. Received the same bar code, because identifier the standard postage. Romania introduced this technology in 1996 and South Africa in 2000.

Barcode to identify certain classes of mail. Few countries have issued stamps with bar codes incorporated in the design to assist in the automatic sorting of this type of mail.

Barcode as postal codes. The postal code on the envelope is encoded electronically in a series of vertical stripes usually printed below the address. Sometimes the stripes are printed in luminescent ink.

Postal barcode to enable the sorting of mail.

From 1961 till 1981 a barcode next to the main cancellation was used for mail from Rotterdam (Nederland) to 64 main cities. There are 4 codes blocs; lowest 2 code blocs contain de city, the uppermost 2 code blocs contain the code machine.

In May 1981 the system was stopped and replaced by CMC-7 coding systems.

The Netherlands Revenue Service did away with the stamp altogether in 1996 when it introduced diskette mailers for return of a diskette containing an electronic Tax return document.

The stamp (top right) has been replaced by a bar coded FIM (**F**ront **I**dentification **M**ark).

In a test of barcode technology in Japan, eight current definitives with barcode added in the margins were sold between June 10

---------- Catalog by categories B

and Sept. 30, 1996, in 18 post offices of the Kanagawa prefecture. This prefecture includes Yokohama.

The barcode were placed in the top and bottom margins adjacent to the four corner stamps.

Switzerland introduced the barcode FIM in 1998 but left the imprint of the printed stamp.

Year	Country	Cat. No.
1982	Great Britain	GB 03
1984	Finland	FIN 06
1986	Canada	CAN 13
1986	Venezuela	VNZ 11
1987	Canada	CAN 16
1988	Canada	CAN 19
1989	Canada	CAN 20
1990	Canada	CAN 21
1990	China, Hong Kong	HK 04
1991	Canada	CAN 22
1992	Canada	CAN 24
1992	New Zealand	NWZ 04-04a
1993	Canada	CAN 25
1993	Switzerland	CH 14-16
1993	USA	USA 31
1994	Canada	CAN 28
1994	Finland	FIN 16
1994	Singapore	SIN 20
1995	Canada	CAN 29
1996	China, Republic of	ROC 28
1996	Finland	FIN 20
1997	Brazil	BZ 25-27
1997	Sweden	SWE 08
1998	Brazil	BZ 29-31
1998	China, Hong Kong	HK 12
1998	Germany	D 13
1998	Singapore	SIN 22a-23
1999	USA	USA 39
1999	USA	USA 42-43
2000	Finland	FIN 21
2000	Netherland	NL 42
2000	South Africa	RSA 04
2001	Austria	OS 10
2001	Belgium	BL 15
2001	Netherland	NL 45-46
2001	Singapore	SIN 30
2002	Argentina	AR 12
2002	Austria	OS 13
2002-4	Austria	OS 14
2002	Canada	CAN 47a
2002	Croatia	HR 07
2002	Hungary	HU 35
2002	Netherland	NL 49
2003	Germany	D 23

2003	Netherland	NL 51 sheet
2003	Netherland	NL 53
2003	South Africa	RSA 08
2004	Germany	D 24
2005	Brazil	BZ 42
2005	Netherland	NL 54
2005	South Africa	RSA 09
2006	Brazil	BZ 42A
2007	Belgium	BL 21
2007	Netherland	NL 56
2007	USA	USA 62
2008	Austria	OS 33-34
2008	Belgium	BL 22
2008	Italy	IT 38A, IT 38B, IT 38C
2010	Netherland	NL 61
2011	Netherland	NL 64A-64B
2013	Brazil	BZ 47 block
2014	Portugal	POR 37
2015	Cyprus	CY 04
2016	China, People's Republic of	PRC 28
2016	Slovenia	SLO 20
2017	Albania	ALB 10
2018	Brazil	BZ 48-50
2018	Germany	D 32
2019	Germany	D 33 - D 34

Mobile tagging. The 2D data matrix barcode can be read by the tag reader software on your mobile phone (using its camera lens). The software then connects your mobile phone to the BeeTagg on the Swiss stamp on the left directs you to be Swiss Tourism website.

A similar system used in Finland goes under the name *upcode*.

Year	Country	Cat. No.
2007	Switzerland	CH 27
2008	Finland	FIN 23-24

Quick Response code - QR code. A QR code is a type of 2D matrix barcode first designed for the automotive industry. The code consists of black modules arranged in a square pattern on a white background. The information encoded can be made up of any kind of data (e.g., binary, alphanumeric or Kanji symbols). Created by Toyota subsidiary Denso Wave in 1994 to track vehicles during the manufacturing process, the QR code is one of the most popular types of 2D barcode. It was designed to allow its contents to be decoded at high speed.

Year	Country	Cat. No.
2010	Netherland	NL 63

---------- Catalog by categories B

2011	Australia	AU 38 sheet
2011	China, Republic of	ROC 39
2012	China, Hong Kong	HK 31-32
2011	Cook Is.	COK 01-02
2011	Croatia	HR 11
2011	Grenada	GRE 20
2011	Grenada Grenadines	GREG 06
2011	Liechtenstein	LIE 10
2011	Liberia	LBR 04-05
2011	Korea, South	SK 38
2012	Brazil	BZ 44
2012	Germany	D 30-31
2012	Hungary	HU 47
2012	Iceland	IC 08
2012	Italy	IT 42
2012	Netherland	NL 66
2012	Russian Federation	RU 10
2012	Slovenia	SLO 17-18
2013	Bosnia & Herzegovina	BH 05
2013	Bosnia & Herzegovina - Serb admin. - Republic of Srpska	BHS 04
2013	Croatia	HR 12-13
2013	Greece	GR 08-11
2013	Hungary	HU 48-50
2013	Luxembourg	LUX 17
2013	Moldova	MD 12a
2013	San Marino	SAN 10
2013	Russian Federation	RU 10-11
2013	Thailand	THI 43
2014	Italy, Private Post - GPS	ITPP 01
2014	France	FR 45-46
2014	Greece	GR13-16
2014	Poland	PL 26-28
2014	Russian Federation	RU12-15
2014	Spain	ESP 24
2014	Thailand	THI 44
2015	France	FR 47-48
2015	India	IN 20
2015	Italy	IT 42
2015	Netherlands	NL 83
2015	Slovakia	SLV 07
2015	United Arab Emirates	UAE 08
2016	China, People's Republic	PRC 28
2016	China, Republic of	ROC 40
2016	France	FR 49
2016	Hungary	HU 50
2016	Italy, Private Post - GPS	ITPP 02
2016	Malaysia	MLY 35-36
2017	Bhutan	BHU 09-11
2017	Italy	IT 43
2017	Japan	J 25
2018	Belarus	BEL 05
2018	China, Hong Kong	HK 35
2018	Gibraltar	GIB 07

2018	Poland	PL 29-30
2018	Portugal, Private Post	PORPP 01
2019	Belgium	BL 24-25
2019	Bhutan	BHU 12-13
2019	Brazil, Private Post	BZPP 01
2019	France	FR 50
2019	Norway	NOR 13
2019	Norway	NOR 15
2020	China, People's Republic	PRC 36
2020	Croatia	HR 14-15
2020	Italy	IT 44
2020	Japan	J 26
2020	Kyrgystan	KYZ 05
2020	Niger	NIG 20
2020	Norway	NOR 16

Chameleon code (**C-code**) is a hidden code which is embedded within an image. *C-code* is a next generation of tagging codes.

The *C-code* transforms traditional offline marketing, such as print advertising, images in magazines, packaging, stamps and billboards into interactive relevant and multimedia platforms.

Year	Country	Cat. No.
2011	Netherland	NL 64A-64a-64B
2012	Netherland	NL65-70
2013	Finland	FIN 25
2013	Netherland	NL71-73
2014	Netherland	NL 74-82
2015	Netherlands	NL 83
2019	Netherlands	NL 84-91
2019	Netherlands	NL 93-101

---------- Binary code

The ***binary system*** stands at the basis of computer technology. In this system each digit of a number is multiplied by a progressively higher power of 2. ***Binary code*** - ones and zeros. Example: 11101 binary = 29 decimal ($1*2^4 + 1*2^3 + 1*2^2 + 0*2^1 + 1*2^0$).

Year	Country	Cat. No.
1966	Czechoslovakia	CZ 05
1967	Canada	CAN 01
1987	Tunisia	TUN 10
1987	USA	USA 19
1990	Israel	IL 12
1991	Great Britain, Man	GBM 02
1988	Iceland	IC 03
1995	Malta	MAT 05
1996	Canada	CAN 30
1997	China, People's Republic of	PRC 11
1997	Nigeria	NIG 12
1998	Netherland, Antilles	NEA 12
1998	Venezuela	VNZ 21

---------- Catalog by categories B

1998	Venezuela	VNZ 25-26
1999	Canada	CAN 35
1999	Canada	CAN 37
1999	Canada	CAN 40
1999	China, People's Republic of	PRC 16
1999	Great Britain	GB 14
1999	Sweden	SWE 09
2000	Canada	CAN 41
2000	Canada	CAN 43
2000	Canada	CAN 46
2000	China, Hong Kong	HK 13-14
2000	Finland	FIN 21
2000	Hungary	HU 33
2000	Pakistan	PAK 08
2000	Portugal	POR 17
2000	Portugal	POR 19
2000	Saint Vincent	STV 14
2000	Sweden	SWE 10
2001	B&H Croat Admin.	BHC 02
2001	China, Macao	MAC 09
2001	China, Republic of	ROC 36
2001	Korea, South	SK 20
2001	Pitcairn Islands	PIT 05-08
2001	Portugal	POR 22
2001	Viet Nam	VIT 12-13
2002	China, Hong Kong	HK 19
2002	Cuba	CUB 15
2002	Indonesia	IND 23
2002	Korea, South	SK 23
2002	Maldives Is.	MLV 11
2002	Mexico	MEX 34
2002	Thailand	THI 31
2003	China, People's Republic of	PRC 18
2003	China, Hong Kong	HK 24
2003	China, Macao	MAC 14
2003	Egypt	EGY 10
2003	Hungary	HU 37
2003	Iran	IRA 13
2003	Korea, South	SK 25-26
2003	Netherland	NL 51
2004	Egypt	EGY 12
2004	Great Britain	GB 19
2004	Hungary	HU 38-41
2004	Madagascar	MK 06
2004	Malaysia	MLY 27
2004	Viet Nam	VIT 17
2004	Yemen, Republic of	YR 02
2005	China, Republic of	ROC 38
2005	China, Hong Kong	HK 26
2005	Egypt	EGY 15
2005	Oman, Sultanate of	OM 05
2005	Tunisia	TUN 32
2005	Viet Nam	VIT 19
2006	Azerbaijan	AZ 06

2006	China, Macao	MAC 16
2006	Hungary	HU 44
2007	Cuba	CUB 21-22
2007	Singapore	SIN 47
2007	Tunisia	TUN 36
2008	Belarus	BEL 04
2008	Iran	IRA 14
2008	Korea, South	SK 37
2009	Algeria	ALG 13
2009	Cuba	CUB 26-27
2009	Ecuador	EQ 12
2009	India	IN 16
2010	Cuba	CUB 28
2010	Gabon	GA 16
2010	Israel	IL 43
2010	Malaysia	MLY 31
2010	South Africa	RSA 11
2010	Sweden	SWE 13
2010	Tunisia	TUN 40
2011	Indonesia	IND 24
2011	Morocco	MOR 11
2012	Germany Private Post - CITI POST	DPP 01
2013	Armenia	ARM 04
2013	China, Hong Kong	HK 33
2013	Romania	RO 42
2014	China, People's Republic of	PRC 27
2014	Thailand	THI 44
2015	Lithuania	LIT 03
2015	Romania	RO 43-44
2015	Serbia	SRB 06a
2016	CUB	CUB 33
2016	Slovenia	SLO 20
2017	Algeria	ALG 15
2017	China, People's Republic of	PRC 30
2017	Mongolia	MOG 18
2018	China, People's Republic of	PRC 34
2018	Israel	IL 48
2018	Russian Federation	RU 16
2018	USA	USA 77
2020	Sierra Leone	SIL 19

---------- Biometric authentication

Biometric authentication is a concept in data security. Biometric authentication solutions (fingerprint, retinal detection, voice recognition) create a data-generated model that represents the individual. With that model and biometric information, security systems can authenticate access to applications and other network resources.

Year	Country	Cat. No.
2017	San Marino	SAN 12

---------- Catalog by categories C

---------- Calculating tools

Early recording and calculating devices are:

- ***Complex astronomical calculation system***, designed by Johannes KEPLER (1571-1630), Germany.

- ***First calculating device***, built by Wilhelm SCHICKARD (1592-1635) at the TUBINGEN University - Germany (in 1623). The device executes addition and deduction's operations, using an automatic transfer mechanism. Shortly after achievement it was destroyed by fire (1624) and rebuilt in 1960 by Prof. Dr. B. baron von Freytag Loringhoff, according to drawings by Schickend sent to Kepler.

- ***Slide rule*** - a calculating device were used for rapid calculations, mainly multiplication and division, algebraic and trigonometric operations. Those calculations consisted of a fixed rule; a mobile and a slider with one up three reticular threads. Based on Napier's principle of logarithms, the slide rule came in use in 1630 after William GUNTER's (1851-1626) created the logarithmic scale. In 1654, Robert BISSAKER, as it know today, i.e., a sliding bar between two fixed wedges, made the first slide rule. A. NANHEIM, a French army officer, established the slide rule's present form in 1850. Galileo GALILEI (1564-1642), at University of Padua, developed a calculating rule that he described in his 1606 booklet *The operations of the Geometric Military Compass*. This was the most widely used scientific computing device for the next couple of centuries till the slide rule made its appearance. It later became known as a *sector*. The main part of the sector was two straight pieces linked by a movable joint at their ends. Each contained mathematical scales. By opening the compass at some fixed angle, the distances on the scales were transferred with a pair of dividers. In this way simple proportion, such as a/b = c/d, could be de-termined. The slide rule became obsolete when the electronic HP-35 pocket calculator arrived on the scene in 1972.

- ***Proportional compass*** - a calculating device which looks like a set of dividers was used by draftsmen to enlarge or reduce drawings. It could also be used to calculate square and cube roots.

Year	Country	Cat. No.
1933	Italy	IT 03
1942	Italy	IT 06
1945	Italy	IT 08

1957	Romania	RO 05
1964	Congo Democratic Republic	CDR 01
1964	Czechoslovakia	CZ 03
1964	Germany, DDR	DDR 09
1964	Hungary	HU 06
1964	Italy	IT 10
1964	Romania	RO 06
1964	Soviet Union	USSR05a
1965	Panama	PAN 01
1965	Paraguay	PAR 08-09
1966	Ecuador	EQ 03
1966	Ecuador	EQ 04
1969	Burundi	BRD 01
1969	Israel	IL 03
1969	Yemen, Kingdom	YKG 01-02
1970	Niger	NIG 01
1970	Niger	NIG 04
1971	Ascension	AS 01
1971	Dahomey	DAH 03
1971	Germany, DDR	DDR 14
1971	Mexico	MEX 04-04a
1971	Nicaragua	NIC 02
1971	Romania	RO 12
1973	Germany, FRG	FRG 05
1974	Saint Pierre & Miquelon	STP 02
1979	Comoro Is.	COM 11
1980	Benin	BEN 03
1980	Hungary	HU 17
1980	Korea, Democratic People's Republic	DPRK 06-07
1980	Mali	MA 09
1980	Mongolia	MOG 06
1981	Guinea Bissau	GUS 05
1982	San Marino	SAN 02
1983	Italy	IT 18
1984	Central African Republic	CEA 13
1984	Djibouti	DJ 04
1984	Laos	LAO 06
1985	Central African Republic	CEA 16
1986	Cambodia	CA 01
1986	Laos	LAO 10
1986	Lesotho	LST 01
1987	Albania	ALB 04
1988	Comoro Is.	COM 15
1988	Maldives Is.	MLV 07
1990	Sierra Leone	SIL 02-03
1991	Dominica	DOM 04
1991	Grenada	GRE 09
1994	Nicaragua	NIC 08
1994	Slovenia	SLO 01
1994	Vatican City	VAT 02
1996	Comoro Is.	COM 25
1996	Syria	SY 06
1997	Chad	CHD 10

---------- Catalog by categories C

1997	Niger	NIG 14
1998	Uzbekistan	UZ 01
1999	Grenada	GRE 12
1999	Korea, Democratic People's Republic	DPRK 16
1999	Saint Vincent	STV 13
2000	Burundi	BRD 02
2000	Gabon	GA 14
2000	Ireland - Eire	IRL 10
2000	Yugoslavia	YU 14
2001	Slovenia	SLO 12
2003	China, People's Republic of	PRC 20a
2006	Canada	CAN 50
2008	Malawi	MLW 12
2009	Czech Republic	CZR 06
2009	Guinea, Bissau	GUS 11
2009	Korea, DPRK	DPRK 26
2009	Romania	RO 38
2009	Ukraine	UK 07
2009	Uruguay	UR 19

---------- Calculator

A ***calculator*** is a device for performing mathematical calculations, distinguished from a computer by a limited problem solving ability and an interface optimized for interactive calculation rather than programming. Calculators can be hardware or software, and mechanical or electronic, and are often built into devices such as PDAs or mobile phones.

Year	Country	Cat. No.
1965	Iraq	IRQ 01
1968	Colombia	COL 01
1977	China, Republic of	ROC 06
1977	Rwanda	RW 04
1978	Bulgaria	BUL 03
1979	Bulgaria	BUL 05
1983	Thailand	THI 06
1984	Japan	J 07
1985	Mozambique	MOZ 02
1986	China, Republic of	ROC 12
1986	Malaysia	MLY 05
1987	Netherland Antilles	NEA 08
1988	Australia	AU 16
1989	Norway	NOR 03
1990	Seychelles	SEY 03
2000	Gabon	GA 14
2002	China, Hong Kong	HK 22
2004	Uruguay	UR 17
2009	Guinea Bissau	GUS 13
2015	Bermuda	BEM 03
2020	Japan	J26

---------- Calculator, temporal

A ***temporal calculator*** is built by stone and makes the astronomical calculation. Are knows:

- Megalithic calculator of Stonehenge (Great Britain, near of Amesbury - North Salisbury, Wiltshire county).

- Megalithic calculator of Sarmisegetuza Regia (Romania, Grădiștea Muncelului village).

Year	Country	Cat. No.
1975	Romania	RO 14
1990	Great Britain	GB 07
1991	Uruguay	UR 05
1992	United Nations (Geneva)	UNG 04
1999	Chad	CHD 11
2005	Australia	AU 36
2005	Great Britain	GB 21
2007	Great Britain	GB 21a
2019	Panama	PAN 03

---------- Cash register

A ***cash register*** is a mechanical or electronic device for calculating and recording sales transactions, and an attached cash drawer for storing currency. The cash register also usually prints a receipt for the customer. The first cash register was invented (1879) by James J. "Jake" RITTY, and patented (1883) with the help of John Ritty, his brother. He was the owner of a saloon in Dayton, Ohio, USA, and wanted to stop employees from pilfering his profits. Shortly thereafter, Ritty became over whelmed with the responsibilities of running two businesses, so he sold all of his interests in the cash register business to Jacob H. ECKERT of Cincinnati, a china and glassware salesman, who formed the National Manufacturing Co. In 1884 Eckert sold the company to John H. PATTERSON improved the cash register by adding a paper roll to record sales transactions, thereby creating the receipt. In 1906, while working at the National Cash Register Co., inventor Charles F. KETTERING designed a cash register with an electric motor. During the 1960s and 1970s computerized cash registers called electronic data processing point-of-sale terminals were developed. These devices are faster than mechanical cash registers and provide many more functions.

Year	Country	Cat. No.
1953	Germany, DDR	DDR 04
1981	Netherland	NL 15
1984	Bhutan	BHU 03
1988	Australia	AU 15
1988	Singapore	SIN 18
1996	China, Republic of	ROC 26

---------- Catalog by categories C

1998	Venezuela	VNZ 27
2000	Sri Lanka	SRL 14
2015	China, Hong Kong	HK 34

---------- Characters recognition

Characters recognition is the identification of characters by automatic means (mechanic, magnetic and optical). The character is identified based on shape, size weight and style.

*MICR - **M**agnetic **I**nk **C**haracter **R**ecognition* was developed to provide information that can be read by both people and machines. Are known: *E13 format* used in the United States and identified by characters that have some portions much thicker than other; *European CMC7 - **C**haracters **M**agnetic **C**ode format*, where each one of those characters is made up of seven vertical lines.

OCR - Optical Character Recognition is the recognition of printed or written text characters by the computer.

Year	Country	Cat. No.
1973	Switzerland	CH 03
1975	USA	USA 11
1976	Italy	IT 13
1978	Bhutan	BHU 02
1978	Hungary	HU 14
1979	Guyana	GUY 01
1981	Guyana	GUY 02-03
1982	Benin	BEN 05
1982	Guyana	GUY 04
1982	Hungary	HU 19
1983	Guyana	GUY 05-06
1983	Korea, South	SK 06
1983	USA	USA 14
1984	Benin	BEN 07
1984	Spain	ESP 09
1985	Guyana	GUY 07
1985	Hungary	HU 24
1985	Netherland Antilles	NEA 05-06
1986	French Southern & Antarctic Lands Territory	TAAF 02
1990	Ecuador	EQ 06-07
1994	Vatican City	VAT 01-02
2000	Indonesia	IND 15
2010	Cuba	CUB 28

---------- Characters - LED / LCD

Computer output sometimes takes the form of character displays made from ***L**ight **E**mitting **D**iodes - LEDs* or ***L**iquid **C**rystal **D**isplays - LCDs*.

LEDs are usually red, blue or green. They are difficult to see in areas of bright lighting.

LCDs are black or a silver background, and

are sharpest and clearest when viewed straight on and in bright light. Laptops often have an LCD screen.

Year	Country	Cat. No.
1979	Salvador	SAL 01
1980	Cuba	CUB 08
1981	Italy	IT 15
1981	Mongolia	MOG 10
1982	Belgium	BL 06
1982	Central African Republic	CEA 10
1983	French Southern & Antarctic Lands Territory	TAAF 01
1983	Mali	MA 10
1983	Monaco	MON 04
1984	Ireland	IRL 01
1984	Nicaragua	NIC 07
1984	Venezuela	VNZ 10
1985	New Caledonia	NWC 02-03
1985	St Vincent	STV 01
1986	Austria	OS 06
1986	Kenya	KEN 02
1986	Netherland	NL 17
1986	St Pierre & Miquelon	STP 03
1986	Singapore	SIN 16
1986	Vanuatu	VAN 02
1987	Netherland	NL 19
1987	St Pierre & Miquelon	STP 04
1987	Wallis & Futuna Is.	WAF 02
1988	Monaco	MON 08
1988	St Pierre & Miquelon	STP 05
1988	Switzerland	CH 11
1988	Tunisia	TUN 12
1989	Luxemburg	LUX 04
1989	Norway	NOR 03
1989	St Pierre & Miquelon	STP 06
1989	USA	USA 26
1990	Germany, Berlin	BER 07
1990	Germany, FRG	FRG 15
1990	Great Britain - Guernsey	GBG 02
1990	Iceland	IC 04
1991	Bulgaria	BUL 20
1991	Luxemburg	LUX 05
1992	French Polynesia	FRP 01
1992	Mexico	MEX 19
1992	USA	USA 27
1993	Tunisia	TUN 16
1994	Finland	FIN 15
1994	French Southern & Antarctic Lands Territory	TAAF 05
1994	Israel	IL 16
1995	Germany	D 08
1995	Ireland	IRL 07
1995	Italy	IT 23
1995	San Marino	SAN 04
1995	USA	USA 32
1995	Vatican City	VAT 03
1996	Brunei	BR 08
1996	Finland	FIN 19
1997	China, Republic of	ROC 32
1997	Venezuela	VNZ 15
1998	Brunei	BR 10
1999	Bhutan	BHU 04
1999	Grenada	GRE 13
1999	Guinea, Republic	GUR 07
1999	Saint Vincent	STV 13
1999	Tuvalu	TUV 02
2000	Cape Verde	CAP 04
2000	China, Hong Kong	HK 15
2000	Djibouti	DJ 10
2000	Georgia	GEO 01
2000	New Zealand	NWZ 07
2000	Poland	PL 17
2000	Slovenia	SLO 11
2001	Australia	AU 34
2001	Croatia	HR 04
2001	Croatia	HR 05
2001	Denmark	DK 12
2001	France	FR 33
2001	Poland	PL 18
2001	Tajikistan	TAD 01
2002	Georgia	GEO 03
2002	Netherland Antilles	NEA 16
2003	China, People's Republic of	PRC 21-22
2003	Croatia	HR 08
2005	Poland	PL 22-23
2007	Libya	LIB 15
2007	Wallis & Futuna	WAF 04
2014	Thailand	THI 44
2016	Cuba	CUB 33
2017	Mongolia	MOG 18
2020	Sierra Leone	SII 21

---------- Characters - Other

This chapter shows stamps depicting ***computer characters*** that are not included in the previous chapters. For example print characters.

Year	Country	Cat. No.
1970	Mexico	MEX 03
1971	Liechtenstein	LIE 02
1972	Liechtenstein	LIE 03
1973	Poland	PL 04
1974	Cuba	CUB 06
1974	Mauritius	MAS 02
1977	Netherland	NL 10
1975	Hungary	HU 10
1975	Netherland Antilles	NEA 02

1976	Ascension	AS 02
1976	Singapore	SIN 05
1977	Turks & Caicos Is	TUC 01
1978	Finland	FIN 03
1978	Venezuela	VNZ 03
1979	Mauritius	MAS 03
1981	Hungary	HU 18
1982	Turks & Caicos Is	TUC 02
1983	Korea, South	SK 07
1983	Syria	SY 04
1984	Gibraltar	GIB 02
1984	Indonesia	IND 04
1984	Laos	LAO 08
1984	Libya	LIB 04
1984	Malaysia	MLY 02-04
1984	Nigeria	NGR 03
1985	Bolivia	BOL 01
1985	Gibraltar	GIB 04
1986	Ascension	AS 03
1986	Ethiopia	ET 02
1986	Great Britain - Jersey	GBJ 02
1986	Mozambique	MOZ 03
1986	South Africa-Ciskei	RSAC 01
1990	Guinea Bissau	GUS 08
1990	Madagascar (Malagasy Republic)	MDG 07
1990	South Africa - Bophuthatswana	RSAB 05
1990	South Africa-Venda	RSAV 01
1991	Korea, South	SK 13
1993	USA	USA 30
1994	Peru	PER 04
1997	Netherland	NL 33
1998	Malaysia	MLY 09
1998	Slovenia	SLO 05
1999	Malaysia	MLY 13
1999	Netherland	NL 37
2000	French Polynesia	FRP 02
2000	Switzerland	CH 24
2002	Canada	CAN 47
2002	Canada	CAN 48
2006	Spain	ESP 17

---------- Chess computer

With the emergence of microcomputer in the seventies the criterion for deciding if a machine could be called a computer was the game of *Chess*. If the machine could play chess, it was deemed to be a computer.

The development of chess machine knows the following steps:

- *Mechanical Turk* or *Automaton Chess* was developed in 1769 by Wolfgang KEMPELEN (1734-1804), a chess-playing automaton, later revealed to be a hoax.

- *The first real chess machine* (1890), was developed by Luis Torres y QUEVEDO (1852-1936), which played the king-with-rook vs. king end game. He used electro-magnets end a gramophone record to utter checkmate.

- *Deep Blue* the most powerful ***chess computer*** to prove that a computer thinks well than man was designed by IBM to defeat world champion Gary KASPAROV. On May 11, 1997. *Deep Blue* defeated world champion Gary Kasparov in a tournament (3 ½ - 2 ½). Kasparov accused IBM of cheating and demanded a rematch, but IBM declined and retired *Deep Blue*.

- *Deep Fritz*, another powerful chess computer, developed by Franz MORSCH and Mathias FEIST, designed for *multiprocessing*, built in 2002 by German company *ChessBase*. The first match (2002) against world champion Vladimir KRAMNIK ended in a draw (4 - 4).

Year	Country	Cat. No.
1955	Spain	ESP 01
1974	Hungary	HU 09a
1978	Netherland	NL 11
1983	Central African Republic	CEA 12
1983	Spain	ESP 08
1990	Israel	IL 15
1994	Slovakia	SLV 00
1999	Niger	NIG 16
2002	Guinea, Republic	GUR 09aa
2010	Spain	ESP 20

---------- Communications

Communications represent the transfer of messages from one place to another by physical connection (cables) or various telecommunication means (radio, satellite, etc). Communications are crucial for the computer systems since the enable the connection of remote terminals to computers and of computers to computers at remote locations, enabling many applications such as Internet and enterprise multi-sitting. This chapter includes the items concerning: data tele processing, remote control (*telematique*), videotex, optic fibre transmission, and long distance communication - *MAILGRAM*.

Voice over Internet protocol. VoIP technology enables telephone calls to be transmitted via the Internet. Using the Internet allows communication lines to be utilized more efficiently, greatly reducing the cost of the call. The Internet was originally designed to trans-

fer computer data, thus a special application that would allow the transfer of telephone calls via Internet had to be developed.

This type of innovation software was first developed in 1995 by Alon Cohen, Lior Haramati, Ofer Shem-Tov, Elad Sion, Opher Kahane and Dror Tirosh - Israeli software developers at VocalTec. Similar applications have been developed in recent years, based on the Israeli invention, changing the way the world's telephone systems currently operate.

Near-Field Communication (NFC) technology. NFC is a short-range wireless technology that makes your smartphone, tablet, wearables, payment cards, and other devices even smarter. NFC is the ultimate in connectivity. With NFC, you can transfer information between devices quickly and easily with a single touch - whether paying bills, exchanging business cards, downloading coupons, or sharing a research paper.

Year	Country	Cat. No.
1971	Mali	MA 02
1971	Niger	NIG 06
1971	Syria	SY 01
1972	Guinea, Republic	GUR 01
1973	Portugal	POR 02-03
1975	USA	USA 10
1976	Cameroon	CAM 01
1978	Soviet Union	USSR 30a
1979	Germany, Berlin	BER 04
1980	Bulgaria	BUL 06
1981	France	FR 18
1982	Great Britain	GB 04
1983	Finland	FIN 05
1983	Ghana	GH 03
1983	Germany, DDR	DDR 27
1983	Hungary	HU 23
1983	Papua New Guinea	PNG 03
1983	Singapore	SIN 09-11
1983	Trinidad & Tobago	TRT 03
1983	Venezuela	VNZ 08
1984	Japan	J 06
1984	Malaysia	MLY 02
1984	Rwanda	RW 08
1984	Zaire	ZAI 03
1985	Japan	J 09
1985	New Caledonia	NWC 02
1988	Finland	FIN 08
1988	Greece	GR 03
1988	Greenland	GRO 02
1988	Iceland	IC 03
1988	Switzerland	CH 11
1989	Brazil	BZ 18-19

---------- Catalog by categories C

1989	Bulgaria	BUL 16
1989	Ghana	GH 06
1989	Tonga	TON 01
1990	Colombia	COL 05
1990	Korea, South	SK 11
1990	Soviet Union	USSR 62
1991	Sri Lanka	SRL 06
1991	Turkey	TU 15
1992	Brunei	BR 06
1992	Finland	FIN 12
1993	Viet Nam	VIT 07
1994	Poland	PL 16
1994	St Kitts	STK 02
1995	Thailand	THI 16
1996	China, People's Republic of	PRC 08
1996	Japan	J 12
1996	Korea, South	SK 17
1996	Salvador	SAL 04
1997	Brazil	BZ 28
1997	China, People's Republic of	PRC 11
1997	Iran	IRA 10
1998	Thailand	THI 27
1998	Yugoslavia	YU 13
1999	Argentina	AR 10
1999	China, Macau	MAC 03
1999	Netherland Antilles	NEA 13-14
1999	St Helena	STH 02
1999	Tanzania	TAN 04
2000	Brazil	BZ 34
2000	China, Hong Kong	HK 14
2000	France	FR 29
2000	Portugal	POR 16
2001	Kazakhstan	KAZ 01
2001	South Africa	RSA 05
2002	Venezuela	VNZ 28
2004	Portugal	POR 27
2005	Cuba	CUB 18
2006	Singapore	SIN 46
2006	Tajikistan	TAD 02
2006	Trinidad & Tobago	TRT 05
2007	Dominican Rep.	DOR 08
2008	New Caledonia	NWC 13
2008	New Caledonia	NWC 15-16
2009	Israel	IL 42
2009	Jordan	JOR 11
2009	Netherland Antilles	NEA 17
2011	Curacao	CRC 01
2011	Ecuador	EQ 13
2011	Morocco	MOR 11
2012	Angola	ANG 10
2013	Micronesia	MIC 07
2014	China, People's Republic of	PRC 27
2014	Serbia	SRB 05
2015	Estonia	EES 04

2015	Great Britain	GB 29
2015	Mexico	MEX 43
2015	Serbia	SRB 06, SRB 06b
2015	Thailand	THI 45
2017	Cuba	CUB 36
2017	Cuba	CUB 38
2017	New Zealand	NWZ 18
2017	Spain	ESP 27
2017	Sweden	SWE 16
2018	China, People's Republic of	PRC 33
2018-2020	Netherlands Caribbean	NEA 01
2018	Palestian Authority	PNA 02
2018	Palestian Authority	PNA 04
2019	Belgium	BL 29
2019	China, Republic of	ROC 42
2019	Portugal	POR 38
2020	China, People's Republic	PRC 37
2020	Germany	D 35
2020	Portugal	POR 39
2020	Sierra Leone	SIL 15-18

---------- Companies

3Com - **C**omputers, **C**ommunication and **C**ompatibility is a manufacturer best known for its computer network infrastructure products. The company was co-founded in 1979 by R. METCALFE, Bruce BORDEN, and Greg SHAW, and is headquartered in Marlborough, Massachusetts.

3Com is a leading global provider of enterprise and small-business networking solutions.

Year	Country	Cat. No.
1999	Barbados	BAR 06
1999	Palau	PAL 08

ADOBE Systems Inc. founded in 1982 by John E. WARNOCK (1941-) and Chuck GESCHKE. Since then, the two have worked closely together as pioneers in the field of desktop publishing and electronic document technology.

Year	Country	Cat. No.
1999	Palau	PAL 08

Amazon.com Inc. is an American-based multinational electronic commerce company, founded in 1994 by Jeff BEZOS. Headquarter in Seattle, Washington; it is America's largest on line retailer.

Year	Country	Cat. No.
1999	Palau	PAL 08

APPLE Computer Company, founded on April 1, 1976, by Stephen Gary WOZNIAK (1950-), Steven Paul JOBS (1955-2011) and Ronald WAYNE. This company produced

---------- Catalog by categories C

Apple I, Apple II, Lisa and Macintosh personal computers.

Year	Country	Cat. No.
1997	Mexico	MEX 20A
1999	Marshall	MAR 06
1999	Palau	PAL 08
2000	Central African Republic	CEA 32
2003	Pakistan	PAK 10
2007	Guinea, Republic	GUR 09a
2007	Guinea, Republic	GUR 11
2008	Australia	AU 37
2009	Guinea Bissau	GUS 14
2011	Guinea, Republic	GUR 14
2016	Djibouti	DJ 11-13
2018	Mozambique	MOZ 15
2020	Sierra Leone	SIL 21-22
2020	Tuvalu	TUV 05

Atari Inc. was founded in 1972 by Nolan BUSHNELL and Edwin IRRIZARY. It was a pioneer in arcade games, home video games consoles, and home computers. The company's products, such as *Pong* and the *Atari 2600*, helped define the computer entertainment industry from 1970's to the 1980's.

Year	Country	Cat. No.
1999	Palau	PAL 08

AT & T Inc. is the largest provider of both local and long distance telephone services, DSL Internet access and wireless service in USA with 71.4 million wireless customers and more than 150 million total customers.

Year	Country	Cat. No.
1992	Armenia	ARM 01

CANON, founded in 1933, more than 60 years of experience and know-how, from cameras and multimedia. Develops: 1964 - CANOLA 130, the world's first 10-key electronic desktop calculator; 1975 - laser beam printer; 1981 - bubble jet printing technologies.

Year	Country	Cat. No.
1988	Great Britain - Man, Isle	GBM 01
1992	Great Britain - Man, Isle	GBM 03

Google Inc. is an American public corporation, earning revenue from advertising related to its Internet search, e-mail, on-line mapping, office productivity, social networking, and video sharing service as well as selling advertising-free versions of the same technologies. Google has also developed an open source web browser and a mobile operating system.

The Google headquarters, the Googolplex, is located in Mountain View, California.

Google was founded by Larry Page and Sergey Brin while they were students at Stanford University and the company was first incorporated as a privately held company on September 4, 1998.

Year	Country	Cat. No.
2009	Guinea Bissau	GUS 14

Hotmail.com is a free web-based e-mail service operated by *Microsof*t as part of its *Windows Live* group. It was founded by Sabeer BHATIA and Jack SMITH. Launching in July 1996 as ***HoTMaiL*** and funded by the venture capital firm Draper Fisher Jurvetson, it was one of the first web- based e-mail services. Its original name and capitalization refers to *HTML*, the encoding language used by the ***W****orld* ***W****ide* ***W****eb*. It was also one of the first free e-mail providers. It was subsequently acquired by *Microsoft* in 1997, and shortly after it was rebranded as *MSN Hotmail*. The *Hotmail* development and operations groups are based in Mountain View, California.

Year	Country	Cat. No.
1999	Palau	PAL 08

IBM - ***I****nternational* ***B****usiness* ***M****achine*, founded with this name in 1924, worldwide number one in the field of information technology. There are very few countries over the world where IBM is not active.

Thomas J. WATSON, Sr. was IBM chief Executive Officer (1914-1956) and Thomas J. WATSON, Jr. was IBM chairman (1956-1971).

Year	Country	Cat. No.
1940-2	USA	USA 02C
1959	USA	USA 04
1960	France	FR 08
1964	France	FR 10
1968	France	FR 13
1972	Ivory Coast	IVC 01
1978	Netherland	NL 11
1984	Germany, FRG	FRG 11
1985	Japan	J 08
1999	Niger	NIG 16
1999	Palau	PAL 08
1999	USA	USA 43
2000	Micronesia	MIC 04
2000	USA	USA 47
2002	China, Republic of	ROC 36A
2004	Egypt	EGY 13
2004	USA	USA 55
2007	USA	USA 61
2008	China, PR	PRC 24
2008	Guinea, Republic	GUR 12
2008	USA	USA 65
2009	USA	USA 66-67
2018	Djibouti	DJ 14

---------- Catalog by categories C

INTEL Corporation is the world's largest company and the inventor of x86 series of *microprocessors*, the processors found in most *personal computers*. Intel was founded on July 18, 1968 as **INT**egrated **EL**ectronics Corporation and based in Santa Clara, California, USA by semiconductor pioneers Robert NOYCE (Dec. 12, 1927 - June 3, 1990) and Gordon E. MOORE (1929-), and widely associated with the executive leadership and vision Andrew S. GROVE (1936-).

Year	Country	Cat. No.
1999	Palau	PAL 08

MICROSOFT Corp. is founded in 1975 by William Gates and Paul Allen, to develop and sell BASIC interpreters for Altair 8800.

Today the company is a multinational computer technology corporation that develops, manufactures, licenses, and supports a wide range of software products for computing devices.

Headquartered in Redmond, Washington, USA its most profitable products are the *Microsoft Windows operating system* and *Microsoft Office* suite of productivity software.

Throughout history the company has been the target of criticism, including monopolistic business practices and anti-competitive strategies, also including refusal to deal and tying.

Year	Country	Cat. No.
1986	Guinea, Republic	GUR 06a
1999	Palau	PAL 08
2001	Pitcairn Is.	PIT 05
2003	Singapore	SIN 35
2003	Singapore	SIN 41
2008	Guinea, Equatorial	GEQ 03
2009	Guinea Bissau	GUS 14
2012	Pakistan	PAK 13

MIT Media Laboratory is founded in 1985 by Nicholas NEGROPONTE (1966-) provides research in IT.

Year	Country	Cat. No.
1999	Palau	PAL 08

NCR - **N**ational **C**ash **R**egisters Company

was founded in 1894 by John H. PATTERSON, marker of the first mechanical cash registers. Charles F. KETTERING designed the first cash register powered by an electric motor (1906).

Year	Country	Cat. No.
1912-4	USA	USA 01
1932	USA	USA 02A
1933	USA	USA 02AA
1933-4	Great Britain	GB 00
1933-7	Great Britain	GB 00A
1948	Great Britain	GB 00B
1937	USA	USA 02B
1940	USA	USA 02BA
1953	Canada	CAN 00

Nintendo Co., Ltd. is a multinational corporation located in Kyoto, Japan. Founded on September 23, 1989 by Fusajiro YAMAUCHI. Nintendo developed Videogame Company, becoming one the most influential in the industry.

Year	Country	Cat. No.
2006	Japan	J 22

OLIVETTI, founded in 1908 in IVREA by Camilio OLIVETTI, was ranked as Europe's second largest computer company in 1995. Olivetti started with typewriters, later manufactured calculating and accounting machines, and, in 1959 introduced the *ELEA 9000*, first computer designed in Italy.

Year	Country	Cat. No.
1986	Italy	IT 21
2008	Italy	IT 37
2009	Italy	IT 39
2020	Italy	IT 46

SAP AG was founded in the year 1972 as *System Analysis and Protocol Development* by five former IBM engineers. *SAP AG* is the largest European software company and the fourth largest in the world, with headquarters in Walldorf, Germany. It is best known for its SAP ERP (**E**nterprise **R**esource **P**lanning) software.

Year	Country	Cat. No.
2003	New Zealand	NWZ 11

Seagate Technology Inc. founded with this name in 1985 (the name beginning 1973 *Shugart Associates*), by Al SHUGART (1930-), a largest disk-drive company in the world.

Year	Country	Cat. No.
1999	Palau	PAL 08

SHARP Corporation is a Japanese electronics manufacturer, founded in September 1912. It takes its name from one of its

---------- Catalog by categories C

founder's first inventions, the Ecer-Sharp mechanical pencil, which was invented by Tokuji HAYAKAWA in 1915. Other notable achievements include the world's first all-transistor desktop calculator in 1964 and the first LCD calculator in 1973. LCD technology continues to be a key part of Sharp's product range, in both the component and the consumer - appliance sides of the business. Since then it has developed into one of the leading electronics companies in the world.

Year	Country	Cat. No.
1986	China, Republic of	ROC 14

SIEMENS A.G., founded in 1847 by Werner von SIEMENS. Develops: first data processing system (1954); first mass-product, fully transistorized universal computer SIEMENS 2002 (1959); first European 64Kb memory chip (1981); introduces HICOM ISDN communication system (1984); builds the world's fastest neurocomputer SYNAPSE 1 (1992). In October 1999 SIEMENS Computers merged with Japanese FUJITSU.

Year	Country	Cat. No.
2003	Singapore	SIN 36
2004	Singapore	SIN 42

FUJITSU (**FU** - the name of Japan-se company, **JI** - from Siemens, and **TSU** - name of the founder), is the most important actor of Japanese market and the third worldwide leader in the field of information technology service, had purchased ICL (Japanese - English concern) in 2002.

ICL - **I**nternational **C**omputers **L**imited founded in 1968, produced computers of large capacity from the 3rd generation.

Year	Country	Cat. No.
1988	Germany, FRG	FRG 14

Silicon Graphics Inc. was a manufacturer of high-performance computing solutions, including computer hardware and software, founded in 1981 by Jim CLARK and Abbey SILVERSTONE.

Year	Country	Cat. No.
1999	Palau	PAL 08

SIVECO Romania, founded in 1992, software development, IT integrator.

Year	Country	Cat. No.
2004	Romania	RO 34

Thawte Consulting is an Internet consulting company, founded (1995) by Mark SHUTTLEWORTH, the first African in space. Its focus quickly shifted to the security aspect of

e-commerce transaction and high-quality encryption software for Internet transaction. In 2000, at the peak of dotcom industry, Shuttleworth sold his company to Verisign (USA).

Year	Country	Cat. No.
2003	South Africa	RSA 08

Yahoo! Inc. is an American public corporation headquarters in Sunnyvale, California, that provides Internet services worldwide. *Yahoo!* was founded by Jerry YANG and David FILOO in January 1994 and was incorporated on March 1st, 1995.

Year	Country	Cat. No.
1999	Palau	PAL 08

---------- Computer

A ***computer*** is a machine that manipulates data according to a list of instruction.

The word *computer* (French: *ordinateur*, Russian: *компьютер*, German: *rechner*, Romanian: *calculator*), word invented (Romanian: *CUVINTE INVENTATE*) in the 20th century (initial using words: *calculator* and *calculating tools*).

It defines a physic system that processes data introduced in a preestablished form.

The results are provided either as a format accessible to the user or as signals meant to activate other equipment.

The *computer* - an electronic device for storing and processing data (usually in binary form) - *Oxford Modern English Dictionary*.

The *computer* era begin in 1919 with the invention of the double triode (flip-flop) by the Americans W.H. ECCLES and F.W. JORDAN and their description of an electronic circuit allowing.

The *computer* is closely linked with the concept of *automation*. It is widely used in the industrial, commercial and scientific fields.

Year	Country	Cat. No.
1966	Niger	NIG 00
1976	Switzerland	CH 05
1977	Dominican Republic	DOR 01
1978	Comoro Is.	COM 07
1979	China, Republic of	ROC 07
1980	Bulgaria	BUL 06
1981	China, Republic of	ROC 08-09
1981	Togo	TOG 07

---------- Catalog by categories C

1982	Austria	OS 05
1983	Central African Republic	CEA 12
1983	Philippines	PH 01
1983	St. Lucia	STL 01
1984	Venezuela	VNZ 09
1985	Canada	CAN 06
1988	Brazil	BZ 16
1989	Finland	FIN 09
1989	India	IN 03
1990	Germany, Berlin	BER 08
1991	Finland	FIN 10
1992	France	FR 26
1992	Germany	D 02
1992	Iran	IRA 06
1993	Cocos (Keeling) Islands	COI 01
1993	Guyana	GUY 08
1994	India	IN 05
1994	Israel	IL 16
1995	Germany	D 07
1995	Thailand	THI 17-18
1996	China, Republic of	ROC 26
1996	USA	USA 34
1997	China, People's Republic of	PRC 12-13
1997	Venezuela	VNZ 14
1998	Korea, South	SK 18
1999	Malaysia	MLY 11
2000	Algeria	ALG 06
2000	China, PR	PRC 17-18
2000	Russian Federation	RU 04
2000	Viet Nam	VIT 10
2001	Aruba	ARU 01
2001	Bulgaria	BUL 22-24
2001	India	IN 09
2001	Korea, South	SK 21
2001	Moldova	MD 05
2001	Portugal	POR 23
2002	Egypt	EGY 08
2002	Korea, Democratic People's Republic	DPRK 19
2003	Bulgaria	BUL 26
2004	Azerbaijan	AZ 03
2004	Laos	LAO 11
2008	Nigeria	NGR 07
2006	Singapore	SIN 45
2007	Algeria	ALG 11
2008	Algeria	ALG 12
2010	China, PR	PRC 26
2010	Cuba	CUB 28
2010	Germany	D 28
2011	Uzbekistan	UZ 05
2017	Japan	J 24
2017	Marshall Is.	MAR 13
2018	Brazil	BZ 48

---------- Computer games

Computers can also provide entertainment and diversion from day-to-day activities. Today's ***computer games*** are often sophisticated simulations of real and fictional situations.

Important parts in the field of computer games represent the ***computer chess***. *Computer chess* is computer architecture encompassing hardware and software capable of playing chess autonomously without human guidance.

Daniel (Danny) HILLIS designed computer-oriented toys and games.

Year	Country	Cat. No.
1983	Central African Republic	CEA 12
1988	Netherland, Antilles	NEA 10
1990	Israel	IL 13-15
1997	Gambia	GAM 04
1998	Great Britain - Guernsey	GBG 06
1998	Uganda	UG 07
1999	Benin	BEN 09
1999	Central African Republic	CEA 23
1999	Great Britain	GB 14
1999	Niger	NIG 16
1999	Palau	PAL 08
2000	USA	USA 45
2001	Netherland	NL 47-48
2002	Guinea, Republic	GUR 09aa
2005	France	FR 37
2006	Japan	J20
2006	Korea, South	SK 32
2008	Great Britain-Jersey	GBJ 05
2008	Guinea Bissau	GUS 10
2012	Uganda	UG 11
2014	Ireland - Eire	IRL 13-16
2017	Cuba	CUB 34
2018	Djibouti	DJ 14
2020	Great Britain	GB 31

---------- Computer graphics

A variety of computer technologies can be used while designed stamps, thus giving an additional perspective to stamp design (map by computer, linear structures drawn with the computer aid, the various shades were rendered by varying the number of strikes produced by the printer, design produces by calculating various mathematical functions). In 1970 the Dutch Post Administration issued stamps that were fully designed by a computer. A plotter driven by data stored on paper punch tape drew the very complex drawings. Designing complex drawings on stamps by computers is a technique to eliminate falsification, because the complexness discourages coiners. One of the first stamps using this technology is the sheet *Romania - OSAKA 1970*, where the ***computer graphics*** is making using the plotter FACOM 270/30.

---------- Catalog by categories C

At the occasion of the opening of the National Stamp Exhibition NABA 2000 to St. Gall on June 21, 2000, the Swiss Post Office presented the first postage stamp in embroidery of the world, using the computer.

Computer aided design (CAD) is the use of *computer technology* to aid in the design and particularly the drafting (*technical drawing and engineering drawing*) of a part or product, including entire buildings. Drafting can be done in two dimensions (2D) and three dimensions (3D). Drafting is the communication of technical or engineering drawings and is the *industrial arts* sub discipline that underlies all involved technical endeavors.

Year	Country	Cat. No.
1967	Malawi	MLW 01
1968	Canada	CAN 01a
1969	Netherland	NL 02
1970	Italy	IT 11
1970	Netherland	NL 04-08
1970	Romania	RO 09
1971	Germany, FRG	FRG 03
1971	Malawi	MLW 02
1972	Canada	CAN 03
1972	United Nations (New York)	UNNY 02
1973	Dominica	DOM 01
1973	Ghana	GH 01
1973	Germany, FRG	FRG 04
1973	Grenada	GRE 01-02
1973	Portugal	POR 01
1973	Portugal	POR 02-03
1974	New Caledonia	NWC 01
1975	Korea, South	SK 02
1975	Malawi	MLW 03
1975	Poland	PL 05
1975	Singapore	SIN 01
1976	Mexico	MEX 07
1976	Pakistan	PAK 01
1976	Venezuela	VNZ 01
1977	Brazil	BZ 05
1977	France	FR 16
1977	Malawi	MLW 04
1977	Poland	PL 08

1978 China, People's Republic of PRC 05
1978 Comoro Is. COM 08
1978 Finland FIN 03
1978 Malawi MLW 05
1978 Paraguay PAR 17
1978 Venezuela VNZ 04-06
1979 Benin BEN 02
1979 Ethiopia ET 01
1979 Israel IL 07
1979 Madagascar (Malagasy Republic) MDG 03
1979 Mali MA 08
1979 Turkey TU 05
1979 Sweden SWE 03
1980 Central African Republic CEA 07
1980 Chad CHD 07
1980 Central African Republic CEA08
1980 Ivory Coast IVC 02
1980 Togo TOG 06
1981 Germany, FRG FRG 08
1981 Venezuela VNZ 07
1981-2 Netherland NL 16
1982 China, Republic of ROC 11
1982 Malawi MLW 06-07
1982 Poland PL 09-12
1983 Australia AU 07
1983 Cuba CUB 11
1983 Cyprus, Turkish Republic of Northern CYT 01
1983 Germany, FRG FRG 09
1983 Korea, South SK 07-08
1983 Switzerland CH 07
1983 USA USA 13
1984 Australia AU 08
1984 Brazil BZ 11
1984 Canada CAN 04-05
1984 Central African Rep. CEA 14
1984 France FR 20
1982 Malawi MLW 08
1984 Tunisia TUN 06
1985-6 Brazil BZ 13
1985 Bulgaria BUL 12
1985 Canada CAN 07
1985 Central African Republic CEA 18
1985 Monaco MON 05
1985 Turkey TU 06
1985 USA USA 17
1986 Belize BE 01
1986 Bulgaria BUL 14
1986 Cambodia CA 02
1986 Canada CAN 09
1986 Canada CAN 11
1986 Canada CAN 12
1986 Colombia COL 04

---------- Catalog by categories C

1986 Comoro Is. COM 14
1986 Fiji FJ 01
1986 Ivory Coast IVC 03
1986 Montserrat MNS 01
1986-90 Netherland NL 18
1986 Norway NOR 02
1986 USA USA 18
1987 Canada CAN 14-15
1987 Canada CAN 17
1987 Czechoslovakia CZ 15
1987 Grenada GRE 06-07
1987 Montserrat MNS 02
1988 Andorra, French AN 01
1988 Belgium BL 13
1988 Canada CAN 18
1988 French Southern & Antarctic Lands Territory TAAF 03
1988 Germany, Berlin BER 06
1988 Germany, FRG FRG 13
1988 Great Britain-Jersey GBJ 03
1988 Hungary HU 27-28
1988 Liechtenstein LIE 04
1988 Spain ESP 10
1988 Tunisia TUN 11
1988 Turkey TU 08
1988 Venezuela VNZ 13
1989 China, People's Republic of PRC 07
1989 Israel IL 10
1989 Malawi MLW 09
1989 Mexico MEX 16
1989 Mozambique MOZ 04
1989 Switzerland CH 13
1989 United Nations (Geneva) UNG 02
1989 United Nations (NY) UNNY 03
1989 United Nations (Vienna) UNW 01
1990 France FR 24
1990 Comoro Is. COM 16
1990 Grenada GRE 08a
1990 Guinea Bissau GUS 07
1990 Micronesia MIC 01
1990 Netherland NL 20
1990 Sierra Leone SIL 04
1990 South Africa - Venda RSAV 02
1990 United Nations (Geneva) UNG 03
1990 United Nations (NY) UNNY 04
1990 United Nations (Vienna) UNW 02
1991 Bahamas BAH 01
1991 British Antarctic Territory BAT 01
1991 British Antarctic Territory BAT 02
1991 Bulgaria BUL 19
1991 Congo, People's Republic of CPR 03
1991 Denmark DK 06
1991 Finland FIN 11
1991 French Southern & Antarctic

	Lands Territory	TAAF 04
1991	Great Britain-Jersey	GBJ 04
1991	Japan	J 11
1991	Monaco	MON 11
1991	Turkey	TU 14
1991-4	Netherland	NL 24
1991	Netherland	NL 25-26
1992	Canada	CAN 22a-22b-23
1992	Comoro Is.	COM 18
1992	Croatia	HR 00-01
1992	French Polynesia	FRP 01
1992	Oman, Sultanate of	OM 03
1992-5	Comoro Is.	COM 19-22
1993	Bahrain	BHR 01
1993	Australia	AU 18
1993	China, Hong Kong	HK 06
1993	Germany	D 05
1993	Mauritius	MAS 04
1993	Netherland	NL 29
1993	United Nations (Geneva)	UNG 07
1993	United Nations (NY)	UNNY 06
1993	United Nations (Vienna)	UNW 04
1994	Brazil	BZ 23
1994	France	FR 27
1994	Great Britain	GB 09-12
1994	Korea, South	SK 15
1994	Sri Lanka	SRL 09
1994	Turkey	TU 16
1995	Germany	D 07
1995	Netherland	NL 32
1996	Comoro Is.	COM 23-24
1996	Saint Vincent	STV 06
1996	St Vincent	STV 09
1996	Slovakia	SLV 01
1996	USA	USA 33
1997	Israel	IL 21
1997	Portugal	POR 12
1997	Slovakia	SLV 02
1998	Germany	D 11-13
1998	Guinea, Republic	GUR 06b
1998	Monaco	MON 13
1998	Netherland	NL 35
1998	Palau	PAL 03
1998	Russian Federation	RU 01
1998	Venezuela	VNZ 16
1999	Australia	AU 29
1999	Canada	CAN 36
1999	Chile	CHI 03-04
1999	Dominican Republic	DOR 03
1999	Germany	D 15-16
1999	Netherland	NL 38
2000	Algeria	ALG 07
2000	Canada	CAN 42
2000	Bhutan	BHU 05

---------- Catalog by categories C

2000	China, Hong Kong	HK 17
2000	Dominican Rep.	DOR 06
2000	Egypt	EGY 06
2000	French Southern & Antarctic Lands Territory	TAAF 08
2000	Germany	D 17-19
2000	Israel	IL 25
2000	Israel	IL 27
2000	Italy	IT 32-33
2000	Malaysia	MLY 15-18
2000	Sweden	SWE 12
2000	Switzerland	CH 23
2000	USA	USA 49
2001	Antigua & Barbuda	ANT 04a
2001	Brazil	BZ 38
2001	Dominica	DOM 07
2001	Gambia	GAM 05
2001	Guyana	GUY 13
2001	Liechtenstein	LIE 07
2001	Malaysia	MLY 24
2001	Netherland	NL 44-45
2001	Poland	PL 20
2001	Saint Vincent	STV 16
2001	Sierra Leone	SIL 11
2001	Spain	ESP 13
2002	Gambia	GAM 06
2002	Indonesia	IND 21
2002	Italy	IT 35
2002	Netherland	NL 49
2002	Norway	NOR 06-07
2002	South Africa	RSA 07
2002	Thailand	THI 32
2002	USA	USA 52
2003	Gambia	GAM 07
2003	Grenada	GRE 18
2003	Grenada Grenadines	GREG 05
2003	Japan	J16a
2003	Mexico	MEX 35-36
2003	Portugal	POR 26
2003	Saint Vincent	STV 18
2003	Sierra Leone	SIL 14
2003	Slovakia	SLV 05
2003	Thailand	THI 32a
2004	Bahrain	BHR 03
2004	Norway	NOR 09
2005	Thailand	THI 36a
2006	Austria	OS 25
2006	Cyprus, Turkish Republic of Northern	CYT 06
2006	France	FR 39
2006-7	Netherland	NL 55
2006	USA	USA 59-60
2007	Cuba	CUB 24A
2007	France	FR 40

2007	USA	USA 63
2008	Austria	OS 31
2008	Pitcairn Islands	PIT 09
2008	Romania	RO 37
2008	Tunisia	TUN 38
2009	Denmark	DK 14
2009	Germany	D 27
2009	Netherland	NL 57-58
2010	Great Britain	GB 24
2010	Netherland	NL 62
2011	China, Macao	MAC 17
2012	USA	USA 76
2016	India	IN 23
2016	Israel	IL 46
2017	Ukraine	UK 08

---------- Computer programmer

Computer programmer, creating code (write instructions) for software and computer applications and programs.

Augusta Ada Byron, Coutenss de Lovelace (Dec. 10, 1815 - Nov. 27, 1852) is considered to be the first computer programmer.

Year	Country	Cat. No.
2019	Bangladesh	BAN 14
2019	Moldova	MD 14

------ Computer vended postage (CVP)

In several countries, the computer has been used as tool for generating stamps and registration labels. The computer provides the appropriate denominations and, in some cases, the desired messages.

Are known the following solutions:

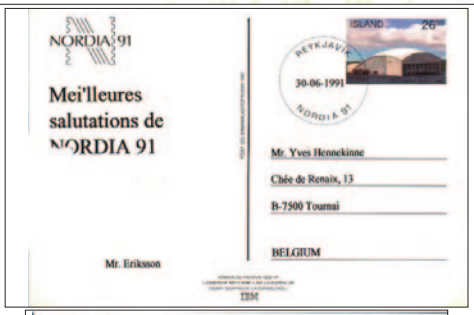
- US Postage Vending Imprinter, *Autopost experiment*, introduced in 1989. The stamp is printed at selling time. Test has taken place on a congress in Washington DC and Kensington MA. After a lot of problems the experiment was cancelled.

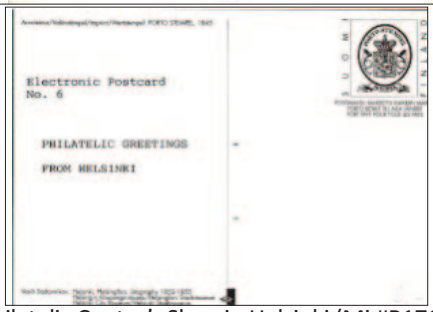
- *Carte Postale Electronique* in France introduced in 1989 was issued at PHILEXFRANCE '89 (Mi #P156 I, P156 II a-f). During the World Stamp Exhibition PHILEXFRANCE '89 in Paris a network of 50 terminals and 2 central printers was set-up.

- *NORDIA '91* (Iceland Postal Authority) - Mi #P77, generated from a computer terminal connected to IBM center.

- *Electronic Postcard* in Finland, introduced in 1993: No. 1 was available at NORDIA 1993 (Mi #P175), No. 2 was available at from the

---------- Catalog by categories C





Philatelic Center's Shop in Helsinki (Mi #P176), No. 3 (Mi #P178), No. 4 was issued at ABOEX '94 (Mi #P182), No. 5 was issued to promote FINLANDIA '95 (Mi #P183), No. 6 was available at FINLANDIA '95 (Mi #P184).

- *CPS - **C**ounter **P**rinted **S**tamps*, Australian system, introduced in 1993, where value and location printed at the point of sale.

- *US Postage Vending Imprinter*, introduced in 1995.

- *US Postage Vending Imprinter*, introduced in 1999 (two types):

Type I was available from 15 NCR Automated Postal Center machines located in central Florida. Machines could produce values as low as 1c as well as values higher than 33 c. The backing paper is taller and wider than the stamp.

Type II was available from 18 IBM Neopost machines located in central Florida.

The backing paper is taller than the stamp. Any denomination could be printed up to $99.99.

- *Japan Postage Vending Imprinter*, introduced in 1997. The denominations of these stamps were printed at the time they were sold.

- *Romanian Postage Vending Imprinter*, introduced in March 17, 1998 at Post Office No. 1 BUCURESTI and Post Office No. 40 BUCURESTI. Allows printing of text on maximum 30 characters (hear - see RO 24: *EFIRO 1998, CUVINTE INVENTATE*).

Year	Country	Cat. No.
1989	USA	USA 20-25
1993	Australia	AU 19
1994	Australia	AU 20-26
1994	Latvia	LV 02
1995	Australia	AU 27-28
1995	Finland	FIN 18
1995	Romania	RO 19
1997	Japan	J 13
1998-2000	Romania	RO 23
1998	Romania	RO 24
1999	Brazil	BZ 32
1999	USA	USA 42-43
2004	USA	USA 55
2007	USA	USA 61
2008	Austria	OS 35
2008	USA	USA 65
2009	USA	USA 66-67
2011	USA	USA 71
2016	China, People's Republic	PRC 27A

---------- Control center

Control center is a generic term for different flavour of technical arrangement within command & control facilities. They represent more or less integrated installations that are used to manage resources in order to achieve results in complex environments. Common to all control center solutions (industrial, air traffic, space mission, harbor, police dispatch, fire fighter dispatch) are underlying principle of control.

Year	Country	Cat. No.
1961	Czechoslovakia	CZ 02
1961	Soviet Union	USSR 05
1963	Soviet Union	USSR 08
1965	Algeria	ALG 01
1965	Soviet Union	USSR 11
1966	Soviet Union	USSR 13
1967	Germany, DDR	DDR 13
1969	Algeria	ALG 02

---------- Catalog by categories C

1970	Bulgaria	BUL 01
1971	Qatar	QA 01
1971	Soviet Union	USSR 19
1971	Soviet Union	USSR 20
1971	Viet Nam	VIT 01
1972	Germany, DDR	DDR 16
1972	Guinea, Equatorial	GEQ 01
1973	Thailand	THI 02
1974	Costa Rica	COR 01
1974	Indonesia	IND 03
1975	Germany, DDR	DDR 22
1975	Soviet Union	USSR 25
1976	Central African Republic	CEA 01 sheet
1979	Central African Republic	CEA 05 sheet
1979	Comoro Is.	COM 13
1979	Mauritania	MAU 05
1979	Mauritania	MAU 08
1979	Niger	NIG 10
1976	Comoro Is.	COM 01-02
1976	Iran	IRA 02
1976	Nicaragua	NIC 04
1976	Niue	NIU 01-02
1976	Soviet Union	USSR 26
1977	Central African Republic	CEA 02 sheet
1977	Guinea Bissau	GUS 03
1977	Mauritania	MAU 02
1977	Niger	NIG 08
1977	Senegal	SEN 02
1977	Yemen Arab Republic	YAR 04
1978	Comoro Is.	COM 10
1978	Korea, Democratic People's Republic	DPRK 05
1978	Romania	RO 16
1979	Barbuda	BAB 01
1980	Soviet Union	USSR 32
1980	Soviet Union	USSR 33
1980	Soviet Union	USSR 34
1981	Barbados	BAR 04
1981	Czechoslovakia	CZ 12
1981	Korea, Democratic People's Republic	DPRK 09
1981	Mongolia	MOG 08
1981	Mongolia	MOG 09
1981	Soviet Union	USSR 35
1981	Soviet Union	USSR 37
1981	Soviet Union	USSR 38
1982	Argentina	AR 03
1982	Central African Republic	CEA 09
1982	Korea, Democratic People's Republic	DPRK 10
1982	Nicaragua	NIC 05-06

1982	Soviet Union	USSR 42
1982	Yemen Arab Republic	YAR 07
1982	Yemen Arab Republic	YAR 09
1983	Bulgaria	BL 08
1983	Jordan	JOR 01
1983	Grenada	GRE 04
1983	Maldives Islands	MLV 05
1983	Soviet Union	USSR 43
1984	Grenada	GRE 05
1984	Libya	LIB 05
1984	Poland	PL 14
1984	Soviet Union	USSR 46
1984	Soviet Union	USSR 49-50
1985	Burkina Faso	BF 01
1985	Canada	CAN 06
1985	Germany, DDR	DDR 32
1985	Korea, Democratic People's Republic	DPRK 13
1985	New Caledonia	NWC 02
1986	Central African Republic	CEA 19
1986	New Zealand	NWZ 03
1986	Soviet Union	USSR 54
1987	Singapore	SIN 17
1987	Singapore	SIN 17 sheet
1987	Solomon Islands	SOI 02
1987	Thailand	THI 08
1987	Soviet Union	USSR 55
1987	Venezuela	VNZ 12
1988	China, Republic of	ROC 16
1988	China, Republic of	ROC 18-19
1988	Ireland	IRL 03
1988	Soviet Union	USSR 57
1988	Soviet Union	USSR 58
1989	Gabon	GA 06
1989	United Nations (Geneva)	UNG 01
1989	Viet Nam	VIT 03
1991	Cayman Island	CAY 01
1991	Monaco	MON 09
1993	Uruguay	UR 08
1994	Botswana	BOT 02
1994	Faeroe Islands	FAR 01
1994	Swaziland	SWA 02
1995	Turks & Caicos Is.	TUC 04
1996	Bangladesh	BAN 04
1996	China, People's Republic	PRC 10
1996	China, Republic of	ROC 27
1996	Libya	LIB 08
1996	Indonesia	IND 11-12
1996	St Vincent	STV 05
1996	St Vincent	STV 08
1997	Egypt	EGY 05
1997	Indonesia	IND 13
1998	China, Hong Kong	HK 11
1998	Slovenia	SLO 03

---------- Catalog by categories C

1999	Malaysia	MLY 11
2000	Russian Federation	RU 04
2000	Grenada	GRE 14
2000	Philippines	PH 08
2000	Viet Nam	VIT 09
2001	Thailand	THI 29
2001	Viet Nam	VIT 12
2002	India	IN 11
2003	Saudi Arabia	SAA 03
2003	Singapore	SIN 37
2004	Belarus	BEL 01
2004	Ukraine	UK 03
2005	Israel	IL 35
2006	Venezuela	VNZ 30
2007	Finland	FIN 22
2007	Israel	IL 36
2008	Singapore	SIN 49
2009	Korea, Democratic People's Republic	DPRK 27
2009	USA	USA 59-61
2010	Korea, Democratic People's Republic	DPRK 28
2011	France	FR 43
2011	Uzbekistan	UZ 06
2012	Mexico	MEX 39
2015	China, Macao	MAC 21
2017	Kiribati	KIR 03
2018	China, People's Republic of	PRC 32
2018	China, People's Republic of	PRC 34
2018	Israel	IL 48
2019	China, People's Republic of	PRC 44

---------- Counting

Before he knows how to write, ***man*** used his fingers and sometimes his toes, in order to express numbers and to make short calculations. Man's *first digital computer* was his fingers. Even with the great advancements in computers, this calculating machine (***counting on fingers***) is still greatly used today. The word *digital* is derived for Latin *digitus* (finger), as a reference to the way man is used to count.

Year	Country	Cat. No.
1939	Mexico	MEX 02
1963	China, People's Republic of	PRC 01

1966	Iran	IRA 01
1967	Spain	ESP 02
1971	Nicaragua	NIC 01
1977	United Arab Emirates	UAE01
1981	Barbados	BAR 03
1984	Tunisia	TUN 05
1985	Canada	CAN 08
1988	Switzerland	CH 12
1990	Malaysia	MLY 06a
1990	Uganda	UG 04
1999	Togo	TOG 09
2003	Algeria	ALG 09
2004	Namibia	NAM 07

---------- Cyber medicine

The computer has many uses in the field of medicine: databases, expert systems to assist the physician in diagnosis, monitoring systems for critical care settings, automated ECG diagnosis, digital imaging (**C**omputer **A**xial **T**omography - CAT scans, and **M**agnetic **R**esonance **I**maging - MRI technology), and computerized laboratory instrumentation.

Year	Country	Cat. No.
1982	Soviet Union	USSR 41
1987	China, Hong Kong	HK 02
1987	Indonesia	IND 05
1994	Great Britain	GB 09-12
1995	Malaysia	MLY 07
1999	Libya	LIB 11a
1999	Marshall Islands	MAR 07
1999	Switzerland	CH 21-22
1999	USA	USA 41
2007	Wallis & Futuna	WAF 04
2009	South Africa	RSA 10
2010	Great Britain	GB 24
2011	China, Macau	MAC 18
2011	Mexico	MEX 38a
2014	Mexico	MEX 42

---------- Cyberspace

Cyberspace is a global domain of electromagnetic accessed through electronic technology and exploited through the modulation of electro-magnetic energy to achieve a wide range of communication and control system capabilities.

The term was originally coined by the cyberpunk science fiction author, William GIBSON.

The now ubiquitous term has become a conventional means to describe anything associated with computers, IT, the Internet and the diverse Internet culture.

Cyberspace is recognized as part of the US national critical infrastructure.

Year	Country	Cat. No.
1999	Palau	PAL 08
2006	Korea, South	SK 31
2009	Venezuela	VNZ 31
2013	Korea, South	SK 40

---------- Data support: ---------- Compact Disk (CD)

The ***Compact disk*** is a storage support for high capacity (ten of GB) in the form of an optically plastic disk using the laser technology. Used today mainly for music, multimedia and software distribution (information in digital form). Introduced in 1983 for recording music, compact disks have been adapted to computers. The data is read by a low powered laser, and there is no physical contact with the compact disk.

Year	Country	Cat. No.
1961	Germany, Berlin	BER 02
1987	Germany, Berlin	BER 05
1987	Portugal	POR 10
1991	Netherland	NL 22
1993	Madagascar (Malagasy Republic)	MDG 12
1994	Brazil	BZ 22-23a
1994	Canada	CAN 26
1995	Argentina	AR 06
1996	Papua New Guinea	PNG 04
1997	Great Britain - Guernsey	GBG 05
1998	Aland	AL 02
1999	Greece	GR 04
1999	Great Britain - Man Isle	GBM 04-05
1999	Marshall Islands	MAR 08
1999	Palau	PAL 08
1999	Papua New Guinea	PNG 06
1999	St Kitts	STK 06
2000	Ireland - Eire	IRL 11
2000	Morocco	MOR 06
2000	Netherland	NL 41
2000	Palau	PAL 10
2000	USA	USA 44
2001	Brunei	BR 15
2001	France	FR 32
2001	Papua New Guinea	PNG 08
2001	Pitcairn Is.	PIT 05-08
2001	Zimbabwe	ZIM 04
2002	Thailand	THI 32
2003	Hungary	HU 37
2003	Luxemburg	LUX 08

2003	Pakistan	PAK 10
2003	Spain	ESP 15
2003	Tunisia	TUN 27
2004	Romania	RO 30
2005	Argentina	AR 13
2005	China, Republic of	ROC 38
2008	Belgium	BL 22
2008	Bhutan	BHU 06-07
2008	France	FR 41
2008	Italy	IT 38
2008	Korea, Democratic People's Republic	DPRK 24
2008	Portugal	POR 32
2009	Bhutan	BHU 08-09
2009	Sri Lanka	SRL 23
2011	Cuba	CUB 29
2018	St. Tome & Principe Is.	STT 06

---------- Data support: ---------- Diskette

The ***diskette*** is made up of a circular piece of thin, flexible plastic inside a protective cover. The plastic disk is coated with metallic oxide to provide a media for magnetically storage of data. The standard diskettes have diameters of 8", 5¼", 3½" (more common nowadays).

Year	Country	Cat. No.
1982	Belgium	BL 07
1992	United Nations (Vienna)	UNW 03
1994	China, Republic of	ROC 24
1996	Bahamas	BAH 02
1997	Great Britain - Guernsey	GBG 05
1998	Spain	ESP 12
1998	Venezuela	VNZ 13
1998	Venezuela	VNZ 25
2000	Malaysia	MLY 22
2004	Romania	RO 33
2006	Senegal	SEN 14
2011	Cuba	CUB 29

---------- Data support: ---------- Flash memory

Flash memory is a non-volatile computer storage chip that can be electrically erased and reprogrammed. It is primarily used in memory cards, USB flash drives, MP3 players and solid-state drives for general storage and transfer of data between computers and other digital products.

Year	Country	Cat. No.
2011	Cuba	CUB 29

---------- Catalog by categories D

---------- Data support: ---------- Magnetic tape cassette

Some of the early microcomputers used ***magnetic tape cassette*** than support for storage. There is very little difference between *computer magnetic cassette* and ordinary *audio tape cassette*.

Year	Country	Cat. No.
1983	Greenland	GRO 01
1985	Netherland Antilles	NEA 07
1988	Grenada	GRE 08
1988	Netherland Antilles	NEA 09
1996	Bahamas	BAH 02
1997	Great Britain - Guernsey	GBG 03
2000	Angola	ANG 02-03
2000	Angola	ANG 05-06
2000	Netherland	NL 43

---------- Data support: ---------- Magnetic disk packs

Magnetic disk packs is a storage support for computer data. The magnetic disk invented by IBM in the early - 1950s contained 100 concen-tric tracks on each side.

Each track stored 500 alphanumeric characters, yielding a total storage capacity of 5 million characters. This disk enabled users to retrieve any piece of information directly in less than a second.

Year	Country	Cat. No.
1977	Romania	RO 15

---------- Data support: ---------- Magnetic strip

The ***magnetic strip*** is a special form of magnetic tape. Included as a part of credit cards, the magnetic strip provides name and account information that can be read by computer input devices, such as an automatic teller machine.

Year	Country	Cat. No.
1989	Yugoslavia	YU 07
1990	Yugoslavia	YU 09
1991	Yugoslavia	YU 11-11a
1992	Bosnia & Herzegovina Serb admin.	BHS 01
1994	Latvia	LAT 01
2001	China, Republic of	ROC 34

---------- Data support: ---------- Magnetic tape

A ***magnetic tape*** consists of a plastic ribbon with an iron oxide coat-ing that can be magnetized. Data is stored on the tape by magnetizing small areas of this coating. Each small area holds a bit that can be a 0 or a 1. Plastic ribbon with standard width of 0.5 inches and covered with a magnetic substance, were used to record information (data) on 7 or 9 tracks. The density of that recording is between 800 and 6125 bits / inch.

Year	Country	Cat. No.
1960	China, Republic of	ROC 01
1968	Australia	AU 01
1971	Canada	CAN 02
1972	Germany, DDR	DDR 18
1973	Colombia	COL 02
1975	Italy	IT 12
1976	Kenya	KEN 01
1976	Tanzania	TAN 01
1976	Togo	TOG 02
1976	Uganda	UG 01
1977	New Zeeland	NWZ 02
1979	China, People's Republic of	PRC 06
1980	Brazil	BZ 09
1980	Libya	LIB 03
1982	Zaire	ZAI 03
1983	Finland	FIN 04
1983	Seychelles	SEY 01
1985	Marshall Is.	MAR 01
1987	Tunisia	TUN 09
1990	Germany, DDR	DDR 39
1990	Turkey	TU 13
1992	Albania	ALB 05
1992	St Helena	STH 01
1994	Indonesia	IND 10
1996	Fiji	FJ 02
1996	Turkey	TU 18
1998	China, Republic of	ROC 33
2000	Korea, South	SK 19
2001	Argentina	AR 11
2011	Cuba	CUB 29

---------- Data support: ---------- Paper printer

Paper printer is support used for printing information (data) supplied by a computer in a form directly interpretable by the user and using the letters of the alphabet, decimal figures, punctuation signs and other special symbols.

---------- Catalog by categories D

Year	Country	Cat. No.
1976	Mexico	MEX 07
1981	Bulgaria	BUL 09
1983	Germany FRG	FRG 09
1983	Sweden	SWE 04
1983	Switzerland	CH 06
1987	Madagascar (Malagasy Republic)	MDG 04
1989	Antigua & Barbuda	ANT 01
1991	Indonesia	IND 07
1992-4	Ukraine	UK 01
1995	Finland	FIN 18

---------- Data support: ---------- Punched card

Punched card. Data is represented by different combination of vertical holes. The punched card is a rectangle cardboard meant for data recording (80 columns), one on each column, through a series of perforations in a pre-established code (12 rows). A punched card measure 73/8 in. x 3¼ in. The punched card used in data processing of: national population census, industrial census, postal checks.

Year	Country	Cat. No.
1964	Israel	IL 02
1968	Netherland	NL 01
1969	Egypt	EGY 01
1969	Japan	J 04
1969	Norway	NOR 01-02
1970	Cuba	CUB 02
1970	Thailand	THI 01
1971	Lebanon	LEB 02
1971	Netherland	NL 09
1972	Ivory Coast	IVC 01
1981	Portugal	POR 07
1981	Netherland	NL 14
1982	Morocco	MOR 03

---------- Data support: ---------- Perforated paper tape

Perforated paper tape is a largely obsolete form of data storage, consisting of a long strip of paper in which holes are punched to store data. It was widely used during much of the twentieth century for teleprinter communication, and later as a storage medium for minicomputers and CNC machine tools.

Perforated paper tape (multiple channel). The characters are codes as circular perforations, transversally disposed on paper tape, in pre-established position

named tracks (5, 6, and 7); to which it is added a perforation with a smaller diameter, named synchronization track.

Jean Maurice Emile BAUDOT developed a code in which each character is represented by five-unit combination.

Year	Country	Cat. No.
1954	Japan	J 02
1959	Israel	IL 01
1962	New Zealand	NWZ 01
1962	Soviet Union	USSR 06
1965	Belgium	BL 02
1965	Denmark	DK 03
1965	Korea, South	SK 01
1965	USA	USA 05
1967	Cuba	CUB 01
1967	Soviet Union	USSR 14
1967	Soviet Union	USSR 15
1968	Argentina	AR 01
1968	Australia	AU 02
1968	Brazil	BZ 02
1970	Switzerland	CH 01
1971	Canada	CAN 02
1971	Cuba	CUB 04
1971	Ecuador	EQ 05
1971	Poland	PL 02
1971	Qatar	QA 03
1971	Soviet Union	USSR 18
1972	Belgium	BL 04
1973	Afganistan	AFG 01
1973	Colombia	COL 02
1973	Papua New Guinea	PNG 01-02
1974	Albania	ALB 02
1974	Bulgaria	BUL 02
1975	Cyprus	CY 01
1975	Czechoslovakia	CZ 07
1975	Poland	PL 06
1975	Singapore	SIN 02
1975	Turkey	TU 01
1976	Australia	AU 06
1976	Austria	OS 04
1976	Gabon	GA 02
1976	Germany, DDR	DDR 23
1976	Rwanda	RW 033
1976	USA	USA 12
1977	Falkland Islands	FAK 01
1977	Poland	PL 07
1977	Portugal	POR 04
1977	Singapore	SIN 03
1977	Singapore	SIN 05
1978	Netherland	NEA 03
1978	Venezuela	VNZ 02
1979	Czechoslovakia	CZ 08

---------- Catalog by categories D

1979	Soviet Union	USSR 31
1980	Brazil	BZ 09
1980	Bulgaria	BUL 07
1980	Czechoslovakia	CZ 10
1980	Czechoslovakia	CZ 11
1980	Korea, South	SK 04
1981	Bulgaria	BUL 08
1981	Bulgaria	BUL 10
1981	Mongolia	MOG 07
1981	Rwanda	RW 07
1981	Soviet Union	USSR 39
1982	Mozambique	MOZ 01
1982	Syria	SY 03
1983	Aitutaki	AI 01
1983	Jordan	JOR 02
1983	Korea, Democratic People's Republic	DPRK 11
1983	Laos	LAO 05
1983	Papua New Guinea	PNG 03
1983	Portugal	POR 08
1983	Singapore	SIN 09
1983	Soviet Union	USSR 45
1984	Bulgaria	BUL 11
1984	Rwanda	RW 09
1984	Soviet Union	USSR 47-48
1985	Italy	IT 20
1986	Iceland	IC 01
1986	Kenya	KEN 02
1986	Soviet Union	USSR 52
1987	Belgium	BL 12
1987	Czechoslovakia	CZ 16
1988	Senegal	SEN 04
1989	Senegal	SEN 07
1990	China, Hong Kong	HK 04
1991-2	Estonia	EES 01
1991	Iran	IRA 05
1991	Sri Lanka	SRL 04
1993	Gabon	GA 08
2006	Tajikistan	TAD 04
2013	Romania	RO 41

Perforated paper tape (single-channel). The multiple-channel perforated paper tape used for computer input and output was developed from the single-channel perforated paper tape used to record the dots and dashes of the telegraph.

Year	Country	Cat. No.
1932	Mongolia	MOG 01
1944	Paraguay	PAR 03
1945	Romania	RO 01
1946	Paraguay	PAR 04
1947	Austria	OS 02
1954	Denmark	DK 01

1955	Finland	FIN 01
1955	Turkey	TU 01
1956	United Nations (NY)	UNNY 01
1957	Indonesia	IND 01
1965	Chad	CHD 01
1965	Czechoslovakia	CZ 04
1965	Gabon	GA 01
1965	Laos	LAO 01
1965	Mali	MA 01
1965	Monaco	MON 01
1965	Morocco	MOR 01
1965	Soviet Union	USSR 10
1965	Tunisia	TUN 01
1965	Volta, Upper	UV 01
1967	Dahomey	DAH 02
1972	Australia	AU 04
1972	Germany, DDR	DDR 17
1972	Mali	MA 03
1972	Mauritania	MAU 01
1974	Austria	OS 03
1976	Comoro Is.	COM 05
1976	Paraguay	PAR 15
1977	Rwanda	RW 05
1978	Yugoslavia	YU 01
1979	Chad	CHD 05
1979	Comoro Is.	COM 12
1979	Germany, FRG	FRG 06
1979	Italy	IT 14
1979	Netherland	NL 12
1979	Sweden	SWE 02
1979	Turkey	TU 04
1981	Spain	ESP 07
1982	Zaire	ZAI 02
1983	Brazil	BZ 10
1987	Djibouti	DJ 07
1987	Monaco	MON 07
1987	Niger	NIG 11
1988	Congo, People's Republic of	CPR 01
1990	Germany, DDR	DDR 38
1992	Cambodia	CA 05
1996	Denmark	DK 08
1997	Marshall Is.	MAR 02
1999	Macedonia, North of	MK 03
2000	Mexico	MEX 30
2000	Yugoslavia	YU 14
2001	Cambodia	CA 06
2002	Azerbaijan	AZ 02
2002	Somalia	SOM 01
2005	Croatia	HR 10
2005	Norway	NOR 11
2006	Hungary	HU 44
2009	Guinea, Bissau	GUS 15
2014	Spain	ESP 23

---------- Digital entertainment

Digital entertainment includes using of computing system and its applications for digital film, emusic, digital TV, edutainment and infotainment.

Year	Country	Cat. No.
2003	Singapore	SIN 34
2011	Ecuador	EQ 13

---------- Digital exchange

Digital exchange is an exchange that switches digital signals by means of digital switching.

Digital exchange is used to provide internal communication.

Year	Country	Cat. No.
1977	Germany, DDR	DDR 24
1979	Great Britain-Jersey	GBJ 01
1985	Solomon Islands	SOI 01
1986	Austria	OS 06
1996	Fiji	FJ 03

---------- Education

The computer is a learning tool for all educational levels, from kindergarten to university. Lessons and tests are stored on the computer. The lessons are shown on the screen and the stu-dent gets the exercise and test. After answering the questions the compu-ter analyzes all answers and decides if the next part of the lesson can beg-in or student has to redo the training.

As tertiary ***education*** the computer is not only a tool used in educational process, but also every research school has its own Department of Science to educate their students and to perform the necessary resea-rch to develop this important branch of science.

Year	Country	Cat. No.
1979	Nigeria	NGR 02
1985	India	IN 01
1985	Zimbabwe	ZIM 01
1986	Tunisia	TUN 08
1989	Bulgaria	BUL 15
1989	Finland	FIN 09
1990	Netherland	NL 21
1991	China, Hong Kong	HK 05
1993	Cocos (Keeling) Islands	COI 01
1995	Philippines	PH 05

1998	Bolivia	BOL 03
1999	Chile	CHI 02
1999	Pakistan	PAK 05-06
1999	Pitcairn Islands	PIT 03
2000	Brazil	BZ 36
2000	Brunei	BR 13
2000	Maldives Islands	MLV 05
2000	Sri Lanka	SRL 12
2001	Belize	BE 03
2001	Singapore	SIN 29
2002	China, Hong Kong	HK 15

---------- Electronic commerce

Computers are used in ***electronic commerce*** mainly for business management, e.g. accounting, inventory and ordering. The data collection begins at the point-of-sale, comprising of an electronic cash register, a scale, optical scanner, and barcode reader. During the 1960s and 1970s computerized cash registers called electronic data processing point-of-sale terminals were developed. These devices are faster than mechanical cash registers and provide many more functions.

Electronic commerce, commonly known ***e-commerce***, consists of the buying and selling of products or services over electronic systems such as the Internet and other com-puter networks. Modern electronic commerce typically uses the World Wide Web at least at some point in the transaction's life cycle although it can encompass a wider range of technologies such as e-mail as well.

Year	Country	Cat. No.
1981	Netherland	NL 15
1996	China, Republic of	ROC 26
1999	Palau	PAL 08
2001	China, Macao	MAC 11-12
2004	Thailand	THI 36
2005	Mauritius	MAS 09
2006	Singapore	SIN 44
2016	China, Republic of	ROC 40
2016	Spain	ESP 26

---------- Electronic franking machines

Electronic franking machine is a machine for franking mail documents and including a drive unit adapted to displace these documents successively along a detector device and a printer head mechanism. This machines are equipped with sophistical features and capabilities (digital printing technology, includes

---------- Catalog by categories E

thermal, inkjet and laser printing techniques).

---------- Electronic mail

Electronic mail (e-mail) is the exchange of computer-stored messages by telecommunication (are usually encoded in ASCII text; however, one can also send non-text files, such as graphic images and sound files, as attachments sent in binary streams). You can also carry on live *conversations* with other users, using *IRC (Internet **R**elay **C**hat)*. The @-symbol as separator in e-mail address introduced by BBN - **B**olt **B**eranek & **N**ewmanin 1972. In the 1980s the ability to send electronic mail to others was proven feasible. Companies established internal networks of computers, and a user of one of those computers could send electronic mail to anyone else on that network.

In the 1990s, the *World Wide Web* provides links between local networks, and electronic mail has become popular across a much wider spectrum of the total population.

For many users, electronic mail has practically replaced the Postal Service for short written transaction.

Year	Country	Cat. No.
1984	Japan	J 06
1985	Australia	AU 09
1985	Japan	J 09
1986	Greece	GR 01
1988	China, Macao	MAC 02
1988	Cyprus	CY 02
1988	Italy	IT 22
1990	Israel	IL 11
1998	Aland	AL 01
1998	Germany	D 14
1998	Mongolia	MOG 11
1998	Spain	ESP 11
1998	Tunisia	TUN 17

1998	Venezuela	VNZ 17
1998	Venezuela	VNZ 22
1999	Ivory Coast	IVC 05
1999	Mexico	MEX 21
1999	Palau	PAL 08
1999	Slovenia	SLO 07
1999	Tunisia	TUN 18-20
2000	B & H Croat Admin.	BHC 01
2000	France	FR 30
2000	Israel	IL 23
2000	Korea, South	SK 19
2000	Morocco	MOR 06
2000	Philippines	PH 09
2000	Portugal	POR 19
2000	Slovenia	SLO 09
2000	Slovenia	SLO 11
2000	Sweden	SWE 10
2000	Tunisia	TUN 21-22
2000	United Nations (Geneva)	UNG 08
2000	United Nations (NY)	UNNY 10
2000	United Nations (Vienna)	UNW 06
2001	Bulgaria	BUL 23
2001	China, Macao	MAC 10
2001	France	FR 31
2001	Korea, South	SK 20
2001	New Zealand	NWZ 09
2001	Poland	PL 18
2001	Tunisia	TUN 23-25
2002	China, Hong Kong	HK 23
2002	Cuba	CUB 15
2002	Indonesia	IND 20
2002	Luxemburg	LUX 07
2002	Mexico	MEX 34
2002	Portugal	POR 25
2003	Bulgaria	BUL 26
2003	Iran	IRA 13
2003	Luxemburg	LUX 08
2003	Tunisia	TUN 28
2003	Uruguay	UR 16
2004	Azerbaijan	AZ 03
2004	French Polynesia	FRP 04-05
2004	Hungary	HU 38-42
2004	India	IN 14
2004	Israel	IL 32
2004	Yemen, Republic of	YR 01
2005	Brazil	BZ 42
2005	Croatia	HR 09
2005	Norway	NOR 12
2005	Portugal	POR 30
2005	Romania	RO 35
2005	Tunisia	TUN 31
2006	Bangladesh	BAN 11
2006	France	FR 38
2006	Tunisia	TUN 33

---------- Catalog by categories E

2007	Cuba	CUB 23
2007	France	FR 39A
2007	Kosovo	KOS 01
2007	Thailand	THI 39
2007	Tunisia	TUN 36
2008	Azerbaijan	AZ 07
2008	Belarus	BEL 04
2008	Faeroe Islands	FAR 08
2008	Guinea Republic	GUR 11
2008	Israel	IL 39
2008	Kosovo	KOS 02
2008	Lithuania	LIT 01
2008	Korea, South	SK 37
2008	Moldova	MD 10
2008	Portugal	POR 32
2008	Tunisia	TUN 39
2008	Ukraine	UK 06
2008	Wallis & Futuna	WAF 05
2009	Algeria	ALG 13
2009	Argentina	AR 14
2009	Egypt	EGY 20
2009	Israel	IL 40
2009	Jordan	JOR 13
2009	Luxemburg	LUX 13
2009	Switzerland	CH 28
2010	Iran	IRA 15-17
2010	Tunisia	TUN 40
2011	China, Hong Kong	HK 28A
2011	Algeria	ALG 14
2011	Ecuador	EQ 13
2011	Luxemburg	LUX 14
2011	Serbia	SRB 02
2012	Bolivia	BOL 07
2012	Germany	D 29
2012	Slovenia	SLO 17
2014	China, People's Republic of	PRC 27
2014	Kazakhstan	KAZ 05
2014	Philippines	PH 16
2015	Serbia	SRB 06
2015	Turkey	TU 24
2015	Viet Nam	VIT 21
2016	Slovenia	SLO 20
2017	Burkina Faso	BF 06
2018	China, People's Republic of	PRC 33
2018	Palestian Authority	PNA 03-04
2019	Panama	PAN 03

---------- Enigma machine

The ***Enigma machine*** is any one of a family of related electromechanical rotor machines used to generate ciphers for the encryption and decryption of secret messages. The Enigma was used commercially from the early 1920's on, and was also adopted by the military

and governmental services of a number of nations - most famously Nazi Germany before and during World War II. The machine has gained notoriety because Allied cryptologists were able to decrypt a large number of the messages that had been enciphered on the machine.

Decryption was made possible in 1932 by Polish cryptographers Marian REJEWSKI (1905-1980), Jerzy ROZYCKI (1909-1942) and Henryk ZYGALSKI (1907-1978) from Cipher Bureau.

The COLOSSUS computer could different tasks, like code breaking (Enigma) - see Alain M. TURING.

Year	Country	Cat. No.
1983	Poland	PL11
1992	USA	USA 29
2000	Antigua & Barbuda	ANT 04
2004	Saint Vincent	STV 19
2005	Great Britain	GB 20
2005	St Helena	STH 03
2008	Guinea, Republic	GUR 12
2009	Poland	PL 24
2012	Great Britain	GB 26
2015	Great Britain	GB 27-30

---------- Fairs

National and international ***fairs*** are the occasions when many countries can display their achievements in the computer industry, in particular, and the hi-tech field in general. *Fairs* also present opportunities to make business relationships as well as research and development ventures.

Year	Country	Cat. No.
1993	Germany	D 04

---------- Ferrite core memory

Ferrite core memory patented in 1955 became the standard for computer memory until the semiconductor integrated circuits arrived in the 1960's. Computers in the fifties and sixties employed *ferrite core memory*.

Year	Country	Cat. No.
1972	Ivory Coast	IVC 01
1998	Hungary	HU 31

---------- Fractal

A ***fractal*** is generally *a rough or fragmented geometric shape that can be split into parts,*

each of which is (at least approximately) a reduced-size copy of the whole, a property called self-similarity.

The term was coined by Banoit Mandelbrot in 1975 and was derived from the Latin *fractus* meaning *broken or fractured*.

Year	Country	Cat. No.
1982	Poland	PL 10
1996	Hungary	HU 30
1997	Israel	IL 21
2000	Finland	FIN 21
2000	Sweden	SWE 12
2001	Poland	PL 18
2001	Spain	ESP 13
2005	China, Macao	MAC 15
2005	Palau	PAL 14
2020	Turkey	TU 26

------ Global Positioning System (GPS)

Global Positioning System (GPS) is a global navigation satellite system (GNSS) developed by the United State Department of Defense and managed by the United States Air Force 50th Space Wing. It is the only fully functional GNSS in the world, can be used freely, and is often used by civilians for navigation purposes. Vessels are using today the GPS, computers and satellites to determine the exact geographical position.

A *GPS* receiver calculates its position by precisely timing the signals sent by the *GPS* satellites high above the Earth. Geometric trilateration is used to determine the receiver's location. The position is displayed, perhaps with a moving map display or latitude and longitude; elevation information may be included. Many *GPS* units also show derived information such as direction and speed, calculated from position changes.

Year	Country	Cat. No.
1978	Netherland Antilles	NEA 03
1984	Zaire	ZAI 03
2000	Marshall Is.	MAR 10
2001	South Africa	RSA 05
2002	Venezuela	VNZ 28
1991	Thailand	THI 10
1992	South Africa-Ciskei	RSAC 02
1996	Fiji	FJ 03a
1998	British Antarctic Territory	BAT 02a
2012	Australia	AU 41
2017	New Zealand	NWZ 17

---------- Identity document (ID) card

An ***identity document (ID) card*** is any document which may be used to verify aspects of a person's personal identity. Is issued in the form of a small, mostly standardized card, and is produced by computer.

Information present on the document or in a supporting database might include the bearer's full name, a portrait photo, age, birth date, address, an identification number, citizenship status. New technologies could allow *identity cards* to contain biometric information, such as photographs, face, hand or iris measurements or fingerprints.

Year	Country	Cat. No.
2000	India	IN 17
2004	Malaysia	MLY 28
2005	Moldova	MD 09

---------- Industrial control systems

The computer is an integral part of the ***industrial control systems***, including supervisory control, data acquisition systems, and distributed control systems.

Year	Country	Cat. No.
1961	Czechoslovakia	CZ 02
1967	Germany, DDR	DDR 13
1978	Romania	RO 16
1981	Czechoslovakia	CZ 12
1982	Argentina	AR 03
1986	Soviet Union	USSR 54
1988	China, Republic of	ROC 16
2000	Russian Federation	RU 04
2006	Venezuela	VNZ 30

---------- Information technology (IT)

Information technology - IT (in French: *INFORMATIQUE*, in Romanian: *TEHNOLOGIA INFORMAȚIEI*) a term encompasses all forms of technology used to create, store, exchange, and use *information* in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived). IT is an assembly of knowledge and methods in the field of data processing. IT becomes an industry, develops continuously, influencing activities in every sphere of life, at home or at work, in banks, shops, schools and hospitals and today computers play an important role in informational society. *Informational society* is seen as the successor to industrial society, where this is based on the IT and automation. Specific to this kind of society is the central position IT has for production and economy.

---------- Catalog by categories I

Year	Country	Cat. No.
1964	Germany, DDR	DDR 07
1966	Niger	NIG 00
1974	Belgium	BL 05
1981	Thailand	THI 04
1983	Singapore	SIN 10-11
1986	Soviet Union	USSR 52
1995	Thailand	THI 15
1996	Canada	CAN 30
1999	Ivory Coast	IVC 05
1999	Luxemburg	LUX 06
1999	Palau	PAL 08
2000	Mexico	MEX 25
2000	Singapore	SIN 25-26
2001	Belgium	BL 18
2001	Lesotho	LST 02
2001	Uganda	UG 08
2002	China, Hong Kong	HK 18-21
2003	Pakistan	PAK 11
2003	Syria	SY 09
2004	French Polynesia	FRP 04-05
2004	Saudi Arabia	SAA 05
2004	Sri Lanka	SRL 18
2004	Thailand	THI 28
2004	Viet Nam	VIT 17
2005	Algeria	ALG 10
2005	Belarus	BEL 02
2005	Cape Verde	CAP 06
2005	Czech Republic	CZR 03
2005	India	IN 15
2005	Ivory Coast	IVC 08
2005	Kyrgyzstan	KYR 03
2005	Libya	LIB 13
2005	Macedonia, North of ~	MK 06
2005	Mali	MA 14
2005	Mauritania	MAU 13
2005	Moldova	MD 08
2005	Mozambique	MOZ 09
2005	Niger	NIG 18
2005	Nigeria	NGR 06
2005	Pakistan	PAK 12
2005	Romania	RO 35
2005	Sudan	SU 04
2005	Syria	SY 10
2005	Tunisia	TUN 30
2005	Ukraine	UK 04
2006	Bangladesh	BAN 11
2006	B & H Croat admin.	BHC 05

2006	Egypt	EGY 17
2007	Algeria	ALG 11
2007	Armenia	ARM 03
2008	Algeria	ALG 12
2008	Greece	GR 07
2008	Portugal	POR 32
2009	Guinea Bissau	GUS 14
2009	Libya	LIB 18
2009	Venezuela	VNZ 31
2010	Gabon	GA 16
2011	Serbia	SRB 03
2011	Sudan	SU 05
2013	China, Hong Kong	HK 33
2013	Cuba	CUB 30
2013	Micronesia	MIC 08
2019	Armenia	ARM 05

---------- I/O devices: ---------- Barcode reader

A ***barcode reader*** (or ***barcode scanner***) is an electronic device for reading *printed barcode*. Like a flatbed scanner, it consists of a light source, a lens and a photo conductor translating optical impulses into electrical ones. Additionally, nearly all *barcode readers* contain decoder circuitry analysing the barcode's image data provided by the photo conductor and sending the barcode's content to the scanner's output port.

Year	Country	Cat. No.
1998	Venezuela	VNZ 18
1998	Venezuela	VNZ 23
2000	Tanzania	TAN 06

---------- I/O devices: ---------- CD unit

Read / write on the ***compact disk*** where the information is recorded in digital form.

Year	Country	Cat. No.
1999	St Kitts	STK 04

---------- I/O devices: ---------- Dighiting drawing board

Dighting drawing board is a device used for transforming a continuously plane curve in a set of binary characters corresponding to the coordinates of the curve's representative points.

Year	Country	Cat. No.
1985	Ireland	IRL 02
1988	Korea, South	SK 09

---------- Catalog by categories I

---------- I/O devices: ---------- Floppy disk

A ***floppy disk*** is a removable data storage device consisting of a thin circular magnetic disc enclosed in a square or rectangular plastic case.

The *floppy disk* was invented by IBM in the early 1970's and was first introduced to provide instructions to the IBM 370 computers. It became diffused with personal computers during 1980's and 1990's as the primary external storage medium. There are different formats 8", 5 ¼", 3 ½".

Year	Country	Cat. No.
1996	Libya	LIB 07

---------- I/O devices: ---------- Hard disk

A ***hard disk drive (HDD)*** is a non-volatile storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaces.

HDDs, was introduced in 1956 as data storage for IBM accounting computer, were originally developed for use with general purpose computers.

Year	Country	Cat. No.
2000	Poland	PL 17

---------- I/O devices: ---------- Joystick

A ***joystick*** is an input device (pointing device) consisting of a stick that pivots on a base and reports its angle or direction to the device it is controlling.

Joysticks are often used to control video games, and usually have one or more pushbuttons whose state can also be read by the computer. A popular variation of the *joystick* used on modern video game consoles is the analogic stick. Miniature finger-operated *joysticks* have been adopted as input devices for smaller electronic equipment such as mobile phones.

Year	Country	Cat. No.
1991	Finland	FIN 11
1997	Gambia	GAM 04
2003	Netherland	NL 53

---------- I/O devices: ---------- Keyboard

Keyboard is the primary text input device, contains certain standard function keys, such as the Escape key, tab and cursor movement keys, shift and control keys, and sometimes other manufacturer - customized keys.

Year	Country	Cat. No.
1978	Brazil	BZ 06
1979	Israel	IL 06
1979	Japan	J 04a
1984	France	FR 19
1985	France	FR 21
1986	Soviet Union	USSR 52
1986	Tunisia	TUN 08
1987	Madagascar (Malagasy Republic)	MDG 04
1987	Netherland Antilles	NEA 08
1989	Mozambique	MOZ 05
1990	Israel	IL 13-15
1990	France	FR 23
1990	Seychelles	SEY 03
1991	Indonesia	IND 07
1991	Sri Lanka	SRL 05
1994	Israel	IL 17
1995	Libya	LIB 06
1996	Bosnia & Herzegovina	BH 01
1996	Romania	RO 20
1997	Great Britain - Guernsey	GBG 05
1998	Libya	LIB 11
1998	Netherland	NL 36
1999	Argentina	AR 09-10
1999	Tuvalu	TUV 02
1999	United Nations (Vienna)	UNW 05
2000	Israel	IL 23
2000	Mexico	MEX 24
2000	Pakistan	PAK 07
2000	San Marino	SAN 06
2000	Sri Lanka	SRL 13
2000	USA	USA 50
2001	Albania	ALB 08
2001	Anguilla	ANU 02
2001	Algeria	ALG 08
2001	Armenia	ARM 02
2001	Bangladesh	BAN 10
2001	Brazil	BZ 39
2001	Brunei	BR 16
2001	Bulgaria	BUL 25
2001	Cape Verde	CAP 05
2001	Croatia	HR 06
2001	Cuba	CUB 14
2001	Colombia	COL 07
2001	Czech Republic	CZR 02

---------- Catalog by categories I

2001	Dominican Republic	DOR 07
2001	Egypt	EGY 07
2001	Ethiopia	ET 03
2001	French Polynesia	FRP 03
2001	Indonesia	IND 19
2001	Iran	IRA 12
2001	Ivory Coast	IVC 06
2001	Japan	J 16
2001	Jordan	JOR 03
2001	Kazakhstan	KAZ 02
2001	Korea, South	SK 22
2001	Kuwait	KUW 03
2001	Kyrgyzstan	KYZ 01
2001	Macedonia, North of ~	MK 04
2001	Madagascar (Malagasy Republic)	MDG 15
2001	Mexico	MEX 31
2001	Moldova	MD 06
2001	Mongolia	MOG 15
2001	Nepal	NEP 04
2001	Nigeria	NGR 05
2001	Oman, Sultanate of	OM 04
2001	Pakistan	PAK 09
2001	Paraguay	PAR 21
2001	Philippines	PH 12
2001	Pitcairn Islands	PIT 05
2001	Poland	PL 19
2001	Qatar	QA 07
2001	Romania	RO 27
2001	Russian Federation	RU 06
2001	San Marino	SAN 09
2001	Slovenia	SLO 13
2001	Spain	ESP 14
2001	Sri Lanka	SRL 15
2001	Tunisia	TUN 25
2001	Uganda	UG 10
2001	Ukraine	UK 02
2001	United Arab Emirates	UAE 05
2001	Uruguay	UR 15
2001	Vatican City	VAT 04
2001	Viet Nam	VIT 14
2001	Wallis & Futuna	WAF 03
2001	Zimbabwe	ZIM 03
2002	Georgia	GEO 02
2002	Mauritius	MAS 07
2002	Peru	PER 06
2002	Senegal	SEN 11
2002	Sudan	SU 01
2002	Viet Nam	VIT 15
2003	Guinea, Equatorial	GEQ 02
2003	Hungary	HU 37
2003	Pakistan	PAK 10
2003	Saudi Arabia	SAA 04
2004	Brunei	BR 19

2004	French Polynesia	FRP 04
2004	Romania	RO 33
2004	Thailand	THI 36
2004	Tristan da Cunha	TDC 01
2004	Yemen, Republic of	YR 01
2005	China, Republic of	ROC 38
2005	Costa Rica	COR 03
2005	South Africa	RSA 09
2006	China, Macao	MAC 16
2006	Ireland	IRL 12
2006	Jordan	JOR 10
2006	Singapore	SIN 43
2006	Trinidad & Tobago	TRT 06
2007	Dominican Republic	DOR 09
2007	Libya	LIB 15
2008	Belarus	BEL 03-04
2008	Colombia	COL 09
2008	Germany	D 25
2008	Guinea, Republic	GUR 12
2008	Libya	LIB 17
2009	Cuba	CUB 26
2009	Israel	IL 40
2009	Spain	ESP 19
2009	Turkey	TU 20
2010	Kuwait	KUW 04
2010	Portugal	POR 35
2010	Uzbekistan	UZ 05
2011	Mozambique	MOZ 14
2012	China, Hong Kong	HK 30
2012	Portugal	POR 36
2014	Spain	ESP 25
2015	Bulgaria	BUL 28
2015	Indonesia	IND 25
2016	Djibouti	DJ 12-13
2016	Spain	ESP 26
2020	Poland	PL 31

---------- I/O devices: ---------- Light pen

Light pen is a device with the shape of a pencil. It has in top a photo-sensitive element at the tip used for the generation an interruption signal, necessary in the display process when point's lighting upwards of where the device is placed. When attached to graphic peripherals it constitutes an instrument used especially in graphic design.

In 1939 IBM introduced a machine that read pencil marks, the *Pencil Mark Sensing Reproducer*, enabling tabulators to read census from much faster. National census forms are scanned today into computers and then processed.

---------- Catalog by categories I

Year	Country	Cat. No.
1970	Switzerland	CH 02
1975	Turkey	TU 03
1982	Great Britain	GB 04

---------- I/O devices: ---------- Magnetic cassette unit

Magnetic cassette unit is a device consisting of permanently encased magnetic tape those winds and rewinds from reel to reel. It contains two flangeless tape reels that are driven by an external drive shaft. The width of the tape is 1/8 in. Magnetic cassette unit used on early PC's.

Year	Country	Cat. No.
1964	Israel	IL 02

---------- I/O devices: ---------- Magnetic disk unit

Magnetic disk unit is an external memory with random access, having as support for information (programs and data) a removable magnetic disk packs.

Year	Country	Cat. No.
1977	Romania	RO 15
1986	Soviet Union	USSR 53

---------- I/O devices: ---------- Magnetic tape unit

Magnetic tape unit is external memory with serial access, having as support for information (data) a magnetic tape.

Year	Country	Cat. No.
1968	Tunisia	TUN 02
1971	Cuba	CUB 04
1972	Germany, DDR	DDR 18
1976	Kenya	KEN 01
1976	Tanzania	TAN 01
1976	Uganda	UG 01
1977	Israel	IL 05
1977	Romania	RO 15
1978	Portugal	POR 05
1979	China, People's Republic of	PRC 06
1979	China, Republic of	ROC 07
1980	Libya	LIB 03
1982	Korea, South	SK 05
1983	Finland	FIN 04
1983	Hungary	HU 21
1983	St. Lucia	STL 01
1984	Bhutan	BHU 03

1985	Mexico	MEX 13-14
1986	Soviet Union	USSR 53
1989	Antigua & Barbuda	ANT 01
1990	Germany, DDR	DDR 39
1990	Turkey	TU 11
1990	Turkey	TU 13
1996	Turkey	TU 18
1998	Libya	LIB 11
2003	Fiji	FJ 07

---------- I/O devices: ---------- Microfilm reader

A ***microfilm reader*** can be attached to a computer. The user can then save the microfilm images to a compact disk.

Year	Country	Cat. No.
1980	Jamaica	JAM 01

---------- I/O devices: ---------- Mouse

Mouse is a small device that a computer user pushes across a desk surface in order to point to a place on the display screen and to select one or more actions to take from that position, using the operation system.

Mouse has two or three buttons and consists of a metal or plastic case, a ball that sticks. Out of the bottom of the case, which rolls on a flat surface, one or more buttons on the top of the case, and a cable or wireless that connects the *mouse* to the computer.

In 1964 Douglas C. ENGELBART invented and patented the *mouse* and the concept of *windows*.

Year	Country	Cat. No.
1991	Finland	FIN 11
1993	Uruguay	UR 07
1995	Brazil	BZ 24
1997	Great Britain - Guernsey	GBG 05
1999	Argentina	AR 09
1999	China, Macao	MAC 06-07
1999	Slovenia	SLO 06
1999	Pitcairn Islands	PIT 03
1999	Switzerland	CH 21-22
2000	China, Hong Kong	HK 16
2000	Denmark	DK 10
2000	Great Britain	GB 17
2000	Korea, South	SK 19
2000	Malaysia	MLY 22
2000	Moldova	MD 04
2000	Philippines	PH 10

---------- Catalog by categories I

2001	France	FR 33-34 sheet
2001	New Zealand	NWZ 09
2001	Pitcairn Islands	PIT 08
2001	Poland	PL 18
2001	Romania	RO 25
2001	Tunisia	TUN 23
2001	Tunisia	TUN 25
2003	Netherland	NL 53
2005	Costa Rica	COR 03
2005	South Africa	RSA 09
2006	China, Macao	MAC 16
2006	Singapore	SIN 43
2007	Tunisia	TUN 36
2008	Wallis & Futuna	WAF 05
2009	Serbia	SRB01
2010	Malaysia	MLY 31
2011	Serbia	SRB 03
2011	Spain	ESP 21
2012	Costa Rica	COR 05
2013	Korea, South	SK 40
2014	China, People's Republic of	PRC 27
2019-2020	Serbia	SRB 08-08a

---------- I/O devices: ---------- Optical reader

An ***optical reader*** is a device found within most computer scanners that captures visual information and translates the image into digital information the computer is capable of understanding and displaying.

An example of *optical readers* are marksense systems for elections where voters mark their choice by filling a rectangle, circle or oval, or by completing an arrow. After the voting a tabulating device reads the votes using *dark mark logic*, where by the computer selects the darkest mark within a given set as the correct choice or vote. Marksense is also used extensively in such areas as lotteries and multiple choice tests.

Year	Country	Cat. No.
1976	Italy	IT 13

---------- I/O devices: ---------- Paper tape puncher

Paper tape puncher is an output device used for the conversion of a binary code. It is connected to the computer and generates a code of perforations on the paper tape.

Year	Country	Cat. No.
1964	France	FR 10

1965	Chad	CHD 01
1973	Hungary	HU 09

---------- I/O devices: ---------- Paper tape reader

A ***paper tape reader*** is a device which translates the information punched in code on *paper tape* into *machine language* and transmits the data into a *central processor*.

Year	Country	Cat. No.
1964	France	FR 11

---------- I/O devices: ---------- Plotter

Plotter is an output device for graphs and designs. Many use small replaceable ink pens in a number of colours. Modern laser printers can perform most of the plotting and graphing tasks required by users, making plotters unnecessary.

Year	Country	Cat. No.
1970	Romania	RO 09
1989	Ireland	IRL 05
1990	Australia	AU 17

---------- I/O devices: ---------- Printer

Printer is a device that accepts text and graphic output from a computer and transfers the information to paper, usually to standard size sheets of paper, in a form directly interpretable by the user. Are known the following type of printers based on: *matrix, inkjet, laser technology*.

Year	Country	Cat. No.
1974	Finland	FIN 02
1975	Germany, DDR	DDR 21
1985	Burkina Faso	BF 01
1987	Netherland Antilles	NEA 08
1989	Czechoslovakia	CZ 17
1992	Finland	FIN 13
1993	Uruguay	UR 07
1994	Thailand	THI 14
1995	Pitcairn Islands	PIT 02
1999	Kiribati	KIR 02
2000	Pitcairn Islands	PIT 04
2001	Brazil	BZ 37
2002	Netherland Antilles	NEA 16
2010	Tanzania	TAN 10

---------- Catalog by categories I

---------- I/O devices: ---------- Punch card reader

A ***punch card reader*** is a machine for reading information represented by holes in a *punched card* and converting it into another form for processing by a *computer*.

Year	Country	Cat. No.
1966	Germany, DDR	DDR 10

---------- I/O devices: ---------- Teleprinter

Teleprinter is a peripheral device which allows the computer to be used remotely (teleprocessing) and in time-sharing mode.

Ion (Iancu) CONSTATINESCU (1884 -1963), licensed (1919) in Paris the *tele-typographical equipment*, forerunner of the present start-stop *teleprinter*.

The *teleprinter* uses the improved 1928 version of MORSE mode. *Remote control (tele-processing)* is the technology that allows data or result's processing at distance or using peripherals connected to the computer through transmission lines (cables, radio, etc.). TELEX as forerunner of the remote control systems.

Year	Country	Cat. No.
1954	Ecuador	EQ 01-02
1954	Romania	RO 04
1958	Soviet Union	USSR 02
1962	New Zealand	NWZ 01
1964	Indonesia	IND 02
1966	Korea, Democratic People's Republic	DPRK 01
1966	Yemen Arab Republic	YAR 02
1968	Romania	RO 08
1971	Romania	RO 11
1972	Barbados	BAR 01
1973	Papua New Guinea	PNG 01
1974	Austria	OS 03
1975	Nigeria	NGR 01
1975	Thailand	THI 03
1975	Turkey	TU 02
1976	Korea, Democratic People's Republic	DPRK 02
1979	Brazil	BZ 08
1979	Brunei	BR 01
1979	Bulgaria	BUL 04
1979	Turkey	TU 04
1982	Samoa	SAM 01
1982	Yemen Arab Republic	YAR 08

1982	Yemen Arab Republic	YAR 10
1983	Brunei	BR 02
1983	China, Macao	MAC 01
1983	Tuvalu	TUV 01
1988	Indonesia	IND 06
1989	Bulgaria	BUL 17
2003	Bosnia & Herzegovina Croat Admin.	BHC 04

---------- I/O devices: ---------- Teletype

Teletype consists of an electronic keyboard and a print mechanism, a reader and a punched paper tape.

Year	Country	Cat. No.
1953	Germany, DDR	DDR 03
1953	Romania	RO 03
1954	Germany, DDR	DDR 05
1962	Soviet Union	USSR 06-07
1964	Hungary	HU 03
1964	Zambia	ZAM 01
1966	Germany, DDR	DDR 12
1972	Ivory Coast	IVC 01
1973	Hungary	HU 08
1975	Turkey	TU 02
1976	Niue	NIU 01
1978	Portugal	POR 05
1978	Senegal	SEN 03
1979	Germany, DDR	DDR 25
1979	Great Britain, Guernsey	GBG 01
1979	Nauru	NAU 01
1981	Soviet Union	USSR 40
1983	Afghanistan	AFG 02
1983	Brunei	BR 03
1983	Laos	LAO 04
1983	Papua New Guinea	PNG 03
1983	Thailand	THI 07
1983	Vanuatu	VAN 01
1984	Haiti	HAI 01
1985	Iraq	IRQ 03
1988	Indonesia	IND 06
1998	Libya	LIB 11
2019	Panama	PAN 03

---------- I/O devices: ---------- Touchpad

A ***touchpad*** (or ***trackpad***) is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to a relative position on screen. *Touchpads* are a common feature of laptop computers, and are also used as a substitute for a mouse where desk space is scarce. Because they vary in size, they can also be found on personal digital assistants (PDAs) and some portable media players. Wireless touchpads are also available as detached accessories.

---------- Catalog by categories I

---------- I/O devices: ---------- Trackball

A ***trackball*** is a pointing device consisting of a ball held by a socket containing sensors to detect a rotation of the ball about two axes - like an upside-down mouse with an exposed protruding ball. The user rolls the ball with the thumb, fingers, or the palm of the hand to move a pointer. Compared with a mouse, a trackball has no limits on effective travel; at times, a mouse can reach an edge of its working area while the operator still wishes to move the screen pointer farther. With a trackball, the operator just continues rolling. Some trackballs, such as *Logitech*'s optical-pickoff types, have notably low friction, as well as being dense (glass), so they can be spun to make them coast.

Large *trackballs* are common on *CAD workstations* for easy precision. Before the advent of the *touchpad*, small *trackballs* were common on portable computers, where there may be no desk space on which to run a mouse. Some small thumbballs clip onto the side of the keyboard and have integral buttons with the same function as mouse buttons. The *trackball* was invented by Tom CRANSTON and Fred LONGSTAFF as part of the Royal Canadian Navy's DATAR system in 1952, eleven years before the mouse was invented. This first *trackball* used a Canadian five-pin bowling ball.

---------- I/O devices: ---------- USB flash drive

USB flash drive is a storage device that could be connected to a computer quickly and easily. In 1999, Dov Moran, an Israeli engineer and entrepreneur, along with his colleagues at Msystems, invented this innovative device. The device did not require a preliminary installation process and it operated using a standard connection that exists in any modern personal computer. It was small, reliable and enabled unlimited expansion of the scope of memory.

Year	Country	Cat. No.
2009	Israel	IL 41
2017	New Zealand	NWZ 16
2018	Israel	IL 47-48

---------- I/O devices: ---------- Video display unit (VDU) ---------- Video display terminal (VDT)

Video display terminal (VDT) is equipment establishing direct communication of the user with its computer, which has a keyboard for data input and/or different devices to facilitate the human - machine interface. *VDT* has once been alphanumeric and monochrome; today they are colour and graphic.

Year	Country	Cat. No.
2012	Italy	IT 40-41
2013	China, Hong Kong	HK 33

---------- I/O devices: ---------- Video display unit (VDU) ---------- Video display terminal (VDT) ---------- CRT technology

Uses *cathode-ray tube (CRT)* or *liquid crystal technology (LCD)* to display text, chart and pictures on a screen similar that of a television.

The user can enter commands or data on the video terminal's keyboard and see the output data on the screen.

Year	Country	Cat. No.
1971	Qatar	QA 02
1973	Qatar	QA 04
1979	Soviet Union	USSR 31
1982	Korea, South	SK 05
1982	Singapore	SIN 08
1983	China, Republic of	ROC 10
1983	Ghana	GH 02
1983	Ghana	GH 04
1983	Hungary	HU 21
1983	Italy	IT 19
1983	Thailand	THI 07
1983	Trinidad & Tobago	TRT 02
1983	Uganda	UG 02
1984	Belgium	BL 09
1984	Germany, FRG	FRG 11
1984	Mauritania	MAU 11
1984	Zaire	ZAI 04
1985	Belgium	BL 10
1985	Brazil	BZ 12
1985	Brunei	BR 04
1985	Burkina Faso	BF 01

---------- Catalog by categories I

1985	France	FR 21
1985	Hungary	HU 25
1985	India	IN 01
1985	Mexico	MEX 12
1985	Mexico	MEX 14
1985	Peru	PER 03
1985	Tunisia	TUN 07
1985	Soviet Union	USSR 51
1985	Zimbabwe	ZIM 01
1986	Kenya	KEN 02
1986	Iraq	IRQ 04
1986	Malaysia	MLY 06
1986	Singapore	SIN 12
1986	Singapore	SIN 13
1987	Yugoslavia	YU 02
1988	Andorra, French Admin.	AN 01
1988	China, Republic of	ROC 17
1988	Ireland	IRL 04
1988	Korea, South	SK 09
1988	Turkey	TU 07
1988	Soviet Union	USSR 58
1988	Yugoslavia	YU 03-06
1989	Bulgaria	BUL 17
1989	China, Republic of	ROC 20
1989	Ghana	GH 05
1989	Ghana	GH 07
1989	Mozambique	MOZ 05
1989	Sri Lanka	SRL 03
1989	Switzerland	CH 13
1989	Tonga	TON 01
1990	Benin	BEN 08
1990	Brazil	BZ 20
1990	China, Republic of	ROC 21
1990	Kenya	KEN 03
1990	Philippines	PH 03
1990	Senegal	SEN 08
1990	Soviet Union	USSR 62
1990	Swaziland	SWA 01
1990	Turkey	TU 10
1990	Turkey	TU 13
1990	Zambia	ZAM 02
1991	Malta	MAT 04
1991	Thailand	THI 10
1991	Tonga	TON 02 -03
1991	Viet Nam	VIT 04-05
1992	Tanzania	TAN 03
1992	Thailand	THI 12
1993	Cocos (Keeling) Islands	COI 02
1993	Korea, South	SK 14
1993	Viet Nam	VIT 06
1994	Nepal	NEP 01
1994	Finland	FIN 14
1994	India	IN 06
1994	Indonesia	IND 10

1995	Brunei	BR 07
1995	Cape Verde	CAP 03
1995	Pakistan	PAK 04
1995	Switzerland	CH 18
1995	Thailand	THI 18
1996	Algeria	ALG 05
1996	Saint Vincent	STV 07
1996	Saint Vincent	STV 11
1997	Brazil	BZ 28
1997	French Southern & Antarctic Lands Territory	TAAF 06
1997	Indonesia	IND 13
1997	Iran	IRA 10
1997	Thailand	THI 23
1998	Italy	IT 30
1998	Syria	SY 07
1999	Brunei	BR 11
1999	Ivory Coast	IVC 05
1999	New Caledonia	NWC 06
1999	Salvador	SAL 08
1999	Slovenia	SLO 06
2000	Australia	AU 30
2000	Australia	AU 32
2000	Brazil	BZ 36
2000	Central African Republic	CEA 31
2000	Korea, Democratic People's Republic	DPRK 18
2000	Malaysia	MLY 14
2000	Malaysia	MLY 20
2000	Mexico	MEX 27
2000	Viet Nam	VIT 11
2001	Mexico	MEX 32
2001	Viet Nam	VIT 12
2002	Bahrain	BHR 02
2002	Bosnia & Herzegovina	BH 03
2002	Chile	CHI 06
2002	Fiji	FJ 06
2002	India	IN 10
2002	Viet Nam	VIT 16
2003	Sri Lanka	SRL 17
2003	Tunisia	TUN 28
2004	Yemen, Republic of	YR 02
2005	Sri Lanka	SRL 19
2005	Viet Nam	VIT 18
2006	Mexico	MEX 37
2006	Senegal	SEN 14
2006	Sri Lanka	SRL 20
2007	Chile	CHI 09
2007	Korea, Democratic People's Republic	DPRK 22
2007	Sri Lanka	SRL 21
2010	Canada	CAN 51
2010	Tanzania	TAN 09-11
2013	Central African Rep.	CEA 34

---------- Catalog by categories I

2013	Mexico	MEX 40
2019	China, Republic of	ROC 43

---------- I/O devices:
---------- Video display unit (VDU)
---------- Video display terminal (VDT)
---------- LCD technology

Laptop computers typically use ***liquid crystal displays (LCDs)*** for their screens. These screen use less electricity and are much flatter than the cathode-ray tube screens usually used on other PCs. LCD screens are composed of a thin layer of a liquid crystal material sandwiched between two polarized sheets of glass. A wire grid separated this material into tiny square areas, each of which becomes a pixel. A small electrical current can change the proprieties of the liquid crystal material in each pixel.

This feature makes possible to use of LCDs as computer screens, as well as for computers, digital watches, cellular telephone, etc.

Year	Country	Cat. No.
1987	Netherland	NL 19
1988	Greece	GR 03
1990	Great Britain - Guernsey	GBG 02
1991	Mexico	MEX 18
1991	Sri Lanka	SRL 06
1992	Indonesia	IND 09
1994	Finland	FIN 15
1994	Netherland	NL 31
1995	Nigeria	NGR 04
1996	Albania	ALB 06
1996	Japan	J 12
1997	Canada	CAN 31
1997	China, People's Republic of	PRC 14
1997	China, Republic of	ROC 30-31
1997	Colombia	COL 06
1997	Thailand	THI 20
1997	Thailand	THI 22
1997	Great Britain - Guernsey	GBG 04
1997	Venezuela	VNZ 15
1998	New Caledonia	NWC 05
1998	Uruguay	UR 12
1999	China, Macao	MAC 04
1999	Korea, Democratic People's Republic	DPRK 15
1999	Mongolia	MOG 13
1999	St Helena	STH 02
1999	Swaziland	SWA 04
2000	Cyprus, Turkish Republic of Northern	CYT 03
2000	China, Hong Kong	HK 15

2000	Israel	IL 26
2000	Japan	J 12
2001	Bosnia & Herzegovina Serb Administration	BHS 02
2001	China, Republic of	ROC 36
2001	France	FR 32a
2001	Korea, South	SK 20
2001	Mongolia	MOG 14
2002	Namibia	NAM 01
2002	Namibia	NAM 03
2002	Namibia	NAM 05
2003	India	IN 12
2004	Anguilla	ANU 03
2004	Portugal	POR 28-29
2005	Switzerland	CH 25
2006	Korea, South	SK 29
2006	Luxemburg	LUX 09
2006	Russian Federation	RU 09
2006	Trinidad & Tobago	TRT 04
2007	Israel	IL 37
2007	Korea, South	SK 33
2007	Mauritius	MAS 10
2007	Tunisia	TUN 36
2007	Wallis & Futuna	WAF 04
2008	Iceland	IC 07
2008	Papua New Guinea	PNG 09
2008	Portugal	POR 32
2008	Thailand	THI 40
2008	Tunisia	TUN 39
2009	Costa Rica	COR 04
2009	Ecuador	EQ 12
2009	Turkey	TU 20
2011	Canada	CAN 52
2011	Mexico	MEX 38
2012	Angola	ANG 09
2012	Australia	AU 39-40
2012	Burundi	BRD 03
2012	China, Macao	MAC 20
2012	Costa Rica	COR 05
2012	Guinea, Republic	GUR 16
2012	Spain	ESP 22
2013	Angola	ANG 11
2013	Cuba	CUB 31
2013	Mexico	MEX 40
2014	China, People's Republic of	PRC 27
2014	Cuba	CUB 32
2014	Kazakhstan	KAZ 05
2014	Mexico	MEX41
2014	Portugal	POR 37
2016	Mexico	MEX 44
2017	New Zealand	NWZ 14
2017	Sweden	SWE 14
2018	Israel	IL 47
2019	Belgium	BL 29

---------- Catalog by categories I

2019	China, People's Republic of	PRC 44
2019	Panama	PAN 03

---------- I/O devices: ---------- Video display unit (VDU) ---------- Monitor

Monitor is a device that accepts text and graphic output from a computer.

Year	Country	Cat. No.
1969	Trinidad & Tobago	TRT 01
1973	Soviet Union	USSR 23
1977	Israel	IL 05
1979	Guinea Bissau	GUS 04
1979	Iraq	IRQ 02
1979	Libya	LIB 02
1979	Malaysia	MLY 01
1979	Mexico	MEX 08
1979	Qatar	QA 06
1979	Spain	ESP 05
1980	Christmas Is.	CHM 01
1980	Yemen Arab Republic	YAR 05-06
1983	Grenada	GRE 04
1999	Grenada Grenadines	GREG 01
1984	Brazil	BZ 11
1984	Grenada	GRE 05
1999	Grenada Grenadines	GREG 02
1984	Kiribati	KIR 01
1986	Singapore	SIN 15
1986	St Pierre & Miquelon	STP 03
1986	Tunisia	TUN 08
1987	Brazil	BZ 15
1987	Philippines	PH 02
1987	St Pierre & Miquelon	STP 04
1987	Soviet Union	USSR 56
1988	China, Republic of	ROC 15
1988	Malta	MAT 03
1988	St Pierre & Miquelon	STP 05
1989	Bulgaria	BUL 15
1989	China, Hong Kong	HK 03
1989	Senegal	SEN 06
1989	St Pierre & Miquelon	STP 06
1989	United Nations (Geneva)	UNG 01
1982	Central African Republic	CEA 11
1988	United Arab Emirates	UAE 02
1990	Djibouti	DJ 08
1990	Yugoslavia	YU 10
1991	Bolivia	BOL 02
1991	Ivory Coast	IVC 04
1991	Thailand	THI 11
1992	Ireland	IRL 06
1992	Netherland	NL 28
1992	USA	USA 28
1992	Russian Federation	RU 00
1993	Thailand	THI 13

1994	Canada	CAN 27
1994	China, Republic of	ROC 25
1994	Sri Lanka	SRL 08
1995	Korea, South	SK 16
1996	China, People's Republic of	PRC 10
1996	Israel	IL 18
1998	Italy	IT 29
1998	United Arab Emirates	UAE 04
1999	Mongolia	MOG 12
1999	Netherland	NL 38
1999	Russian Federation	RU 02
2000	Bosnia & Herzegovina	BH 02
2000	Indonesia	IND 16-17
2000	Sweden	SWE 10
2001	Brazil	BZ 37
2001	Burma	BUR 02
2001	Denmark	DK 11
2002	Italy	IT 34
2002	Thailand	THI 30
2003	Namibia	NAM 06
2003	Norway	NOR 08
2003	Syria	SY 09
2003	Tajikistan	TAD 03
2005	Azerbaijan	AZ 04
2005	Morocco	MOR 07
2005	New Zealand	NWZ 13
2006	Senegal	SEN 12
2006	Tunisia	TUN 34
2007	Cuba	CUB 24
2007	Korea, South	SK 34
2008	Moldova	MD 10
2009	Israel	IL 40
2010	Uzbekistan	UZ 05
2013	Korea, South	SK 40
2014	Mexico	MEX 42
2015	Vatican	VAT 05
2016	Slovenia	SLO 20
2017	India	IN 24
2017	Mongolia	MOG 18
2018	Djibouti	DJ 14
2020	Sierra Leone	SIL 15-18
2020	Sierra Leone	SIL 20
2020	Sierra Leone	SIL 24

---------- Integrated circuit (IC)

Integrated circuit (chip), independently invented by Jack KILBY and Robert NOYCE, it is the current technology, being a logical and digital storage element, which contains electronic circuit components, embedded in a cohesive material. By the late 1960's a number of the computer companies had introduced computers based entirely on integrated circuit.

J. Kilby recorded his initial ideas concerning

---------- Catalog by categories I

IC in July 1958, successfully demonstrating the first working integrated example on September 12, 1958. Patent application in Feb. 6, 1959.

Year	Country	Cat. No.
1980	Japan	J 05
1981	France	FR 17
1983	Australia	AU 07
1983	Germany, DDR	DDR 29
1984	Germany, DDR	DDR 30
1984	Sweden	SWE 05
1985	Germany, DDR	DDR 31
1986	France	FR 22
1986	Singapore	SIN 15
1987	Australia	AU 10
1987	Australia	AU 12
1987	Finland	FIN 07
1987	Monaco	MON 06
1989	Antigua & Barbuda	ANT 01
1990	Botswana	BOT 01
1992	Netherland	NL 27
1992	Tunisia	TUN 15
1993	Gabon	GA 09
1995	France	FR 28
1995	Singapore	SIN 21
1996	Israel	IL 19
1997	Canada	CAN 32
1997	China, Republic of	ROC 30
1999	USA	USA 40
2000	Central African Republic	CEA 31
2000	Singapore	SIN 27
2001	China, People's Republic of	PRC 19
2001	Hungary	HU 34
2002	France	FR 35
2003	China, People's Republic of	PRC 20
2003	Germany	D 22
2004	Malaysia	MLY 28
2004	Thailand	THI 35
2004	Yemen, Republic of	YR 01
2017	Togo	TOG 13
2008	New Caledonia	NWC 14
2008	New Caledonia	NWC 16
2010	China, Hong Kong	HK 28
2011	Romania	RO 39
2020	Tuvalu	TUV 05

---------- Internet

The ***Internet*** is a worldwide system of computer networks - a network of networks in which users at any one computer can, if permitted, get information from any other computer (and sometimes talk directly to users at other computers). Today, the *Internet* is a public, cooperative, and self-sustaining facility accessible to hundreds of millions of people

worldwide. Physically, the Internet uses a portion of the total resources of currently existing public telecommunication network.

The first embryonic version of the *Internet* was conceived by the **A**dvanced **R**esearch **P**rojects **A**gency - ARPA of the US government in 1969 and was first known as the **ARPANet** (the first four computers were linked). Exponential growth of computers: 1969 - 4 computers; 1989 - 100,000 hosts; 2000 - 100,000,000 hosts.

In 1993 commercial *Internet* service providers began selling connections to individuals, and the *Internet* grew explosively around the world.

The *Internet* incorporates a network of millions of host computers. In the *Global Village* with virtually every computer in the world connected to every other computer at click of a button, the world has become a *Global Village*. Through a sample click of the mouse we now have access to knowledge on a global scale. Millions of people accessed the *Internet* with user-friendly Web browsers for business, entertainment and educational purpose. The *Internet*, became available to more people, both privately companies connections. Today all companies have a website. Usually, end in a 2 - character, is country identifier.

Year	Country	Cat. No.
1997	Cayman Island	CAY 02
1998	Belize	BE 02
1998	Italia	IT 29
1998	Russian Federation	RU 01
1998	Saint Vincent	STV 12
1999	China, Macao	MAC 05
1999	Mexico	MEX 21
1999	Palau	PAL 08
1999	Papua New Guinea	PNG 06
1999	Swaziland	SWA 03
2000	Brazil	BZ 35
2000	Central African Republic	CEA 24-25
2000	China, Hong Kong	HK 13
2000	Cyprus, Turkish Republic of Northern	CYT 04
2000	Denmark	DK 10
2000	Ireland - Eire	IRL 11
2000	Mexico	MEX 23
2000	Mexico	MEX 26
2000	Netherland Antilles	NEA 15
2000	Palau	PAL 11
2000	Singapore	SIN 26
2000	Singapore	SIN 28
2000	United Nations (NY)	UNNY 08
2000	Viet Nam	VIT 09
2001	China, Macao	MAC 09-13
2001	Dominica	DOM 08
2001	Israel	IL 29
2001	Japan	J 15
2001	Mongolia	MOG 14
2001	Papua New Guinea	PNG 08
2001	South Africa	RSA 06
2001	Tunisia	TUN 25
2001	Tuvalu	TUV 03
2001	Viet Nam	VIT 13
2002	Indonesia	IND 20
2002	Korea, South	SK 24
2002	Nevis	NEV 05
2003	Mexico	MEX 35
2003	South Africa	RSA 08
2004	Azerbaijan	AZ 03
2004	Thailand	THI 36
2005	China, Hong Kong	HK 26
2005	China, Republic of	ROC 37
2006	Hungary	HU 45
2006	Korea, South	SK 32
2006	Nigeria	NGR 07
2006	Singapore	SIN 43
2006	Spain	ESP 16
2006	Thailand	THI 38
2007	Great Britain	GB 22
2007	Switzerland	CH 27
2007	Tunisia	TUN 36
2008	Colombia	COL 08
2008	Germany	D19
2008	Malawi	MLW 10
2008	Portugal	POR 32
2008	Wallis & Futuna Is	WAF 05
2009	Egypt	EGY 20
2009	Guinea Bissau	GUS 14
2009	Israel	IL 40
2009	Israel	IL 42
2009	Luxemburg	LUX 13
2009	Morocco	MOR 10
2009	Switzerland	CH 28
2010	Belgium	BL 23
2010	Iran	IRA 15-16
2010	Sri Lanka	SRL 24
2010	Tanzania	TAN 12
2011	China, Hong Kong	HK 28A
2011	Indonesia	IND 24
2011	Luxemburg	LUX 14
2011	Mozambique	MOZ 11-12
2011	Netherland	NL 64A
2011	Palau	PAL 16
2011	Serbia	SRB 02
2011	Spain	ESP 21
2011	USA	USA 70-71

---------- Catalog by categories I

2011	USA	USA 74-75
2012	Bolivia	BOL 07
2012	Poland	PL 25
2012	USA	USA 74
2013	Brazil	BZ 46
2013	Micronesia	MIC 06-09
2013	Uruguay	UR 20
2014	China, People's Republic of	PRC 27
2014	Djibouti	DJ 10A
2014	Sri Lanka	SRL 25
2015	Mongolia	MOG 17
2016	Wallis & Futuna	WAF 06
2017	Algeria	ALG 16
2017	Cuba	CUB 37
2016	New Caledonia	NWC 17
2017	Tunisia	TUN 41-42
2019	Panama	PAN 03

---------- iPAD

See *Personal Digital Assistants (PDA)*.

---------- iPhone application

The Royal Mail has released an iPhone application that allows you to use own photos to create personalized stamp, called "***Smilers***®". Royal Mail Smilers® lets you use a saved image on your iPhone: down load the free application and after chosing your image, you can insert it into a rectangular or round smiler. Apply final tweaks, then you can select from a range of stamps for the image to sit along side and confirm purchase. Delivery will receive within five working days.

CEE-App using Chameleon Explorer allows, with the help of a smartphone or iPAD, to recognize a code that accesses an event.

Year	Country	Cat. No.
2005	Great Britain	GB 20
2007	Great Britain	GB 21a
2011	China, Hong Kong	HK 28A
2012	Netherland	NL 68b
2013	Singapore	SIN 50
2015	Ireland - Eire	IRL 17
2015	Malayesia	MLY 34
2016	France	FR 49
2016	New Caledonia	NWC 17
2016	Wallis & Futuna	WAF 06
2018	Ethiopia	ET 05
2019	Belgium	BL 24
2019	Belgium	BL 27
2019	Bosnia & Herzegovina Croat Admin.	BHC 06
2019	Denmark, Faroe Is.	FAR 10
2019	Estonia	EES 06

2019	Gibraltar	GIB 08
2019	Great Britain, Guernsey	GBG 10
2019	Iceland	IC 11
2019	Luxemburg	LUX 18
2019	Netherland	NL 92
2019	Netherland	NL 94
2019	Norway	NOR 14
2019	Switzerland	CH 29

---------- Laptop

Laptop or ***notebook*** is a portable personal computer where the flat screen, keyboard and processor were integrated in one box. Typically weighing is 3 to 12 pounds (1.4 to 5.4 Kg), typically weighing 3 to 12 pounds (1.4 to 5.4 Kg).

The word *Laptop* exists out of *LAP* and *TOP*. *Laptop* term was introduced in May 1983 by GAVILAN S.C. The *laptop* can easily be transported and conveniently used in temporary offices, and at meetings.

Laptops use several different approaches for integrating a mouse into the keyboard, including the touch pad, the trackball, and the pointing stick.

Year	Country	Cat. No.
1992	Ireland	IRL 06
1996	Canada	CAN 30
1997	China, Republic of	ROC 31
1998	Finland - Aland Islands	AL 01
1998	Russian Federation	RU 01
1998	Sri Lanka	SRL 10
1998	Venezuela	VNZ 24-26
1999	Australian Antarctic Territory	AAT 01
1999	French Southern & Antarctic Lands Territory	TAAF 07
1999	Nepal	NEP 03
1999	Netherland	NL 39
1999	Iceland	IC 05
1999	Papua New Guinea	PNG 05
1999	United Nations (Vienna)	UNW 05
2000	Ireland	IRL 11
2000	Japan	J 14
2000	San Marino	SAN 07
2000	Sri Lanka	SRL 12-13
2000	Tonga	TON 04
2000	Sweden	SWE 10 booklet
2001	Australian Antarctic Territory	AAT 02
2001	Brazil	BZ 13
2001	China, Macao	MAC 13
2001	China, Republic of	ROC 36
2001	Denmark	DK 13
2001	Viet Nam	VIT 13
2002	China, Republic of	ROC 36A

2002	Ghana	GH 10-11
2002	Thailand	THI 32
2003	Iran	IRA 13
2003	Russian Federation	RU 08
2003	Sri Lanka	SRL 16
2004	Malaysia	MLY 28
2004	Romania	RO 31
2005	Cuba	CUB 18
2005	Korea, South	SK 27
2005	Morocco	MOR 07
2005	Moldova	MD 09
2005	Netherland	NL 54
2005	Switzerland	CH 26
2006	Chile	CHI 08
2006	China, Hong Kong	HK 27
2006	Jordan	JOR 06
2006	Korea, South	SK 31
2007	Belgium	BL 21
2007	Central African Republic	CEA 33
2007	Singapore	SIN 48
2008	Australia	AU 37
2008	Colombia	COL 09
2008	Germany	D 25
2008	Iran	IRA 14
2008	Korea, South	SK 35
2008	Slovakia	SLV 06
2008	Ukraine	UK 06
2008	Uruguay	UR 18
2009	Costa Rica	COR 04
2009	Malaysia	MLY 30
2009	Netherland Antilles	NEA 17
2009	Saint Thomas and Prince Is.	STT 05
2009	Syria	SY 11
2009	United Arab Emirates	UAE 07
2009	Venezuela	VNZ 31
2010	Bangladesh	BAN 12
2010	Korea, Democratic People's Republic	DPRK 29
2010	Israel	IL 43
2010	Sweden	SWE 13
2010	Uzbekistan	UZ 05
2011	Albania	ALB 09
2011	Bangladesh	BAN 13
2011	Cuba	CUB 29
2011	Indonesia	IND 24
2011	Israel	IL 44
2011	Netherland	NL 64B
2011	Serbia	SRB 04
2012	Angola	ANG 09
2012	Italy	IT 40
2012	Jordan	JOR 14
2012	Malaysia	MLY 32
2013	Brazil	BZ 47
2013	Chad	CHD 12
2013	Malaysia	MLY 33

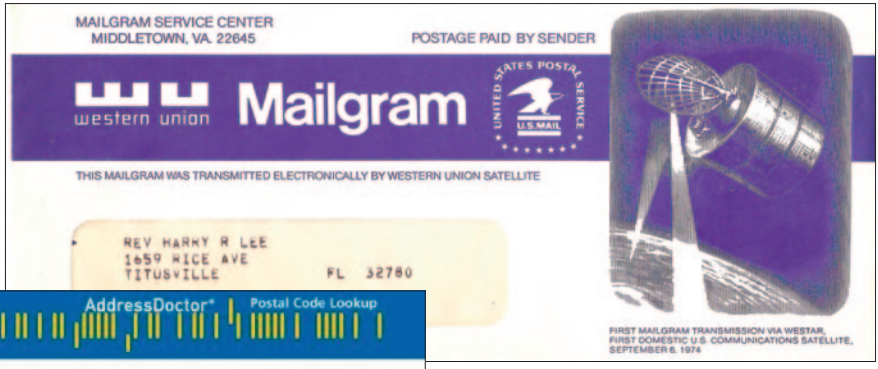
2013	Uruguay	UR 20
2014	Ethiopia	ET 04
2014	India	IN 19
2014	Kazakhstan	KAZ 05
2014	Philippines	PH 18
2014	Venezuela	VNZ 33
2015	Iceland	IC 10
2015	India	IN 21
2015	Romania	RO 44
2015	Turkey	TU 22
2016	Cuba	CUB 33
2016	Kyrgyzstan	KYZ 04
2016	New Caledonia	NWC 17
2017	Algeria	ALG 16
2017	China, People's Republic of	PRC 29-30
2017	Cuba	CUB 38
2017	Mexico	MEX 45
2017	New Zealand	NWZ 14-18 block
2017	Sweden	SWE 15
2018	Canada	CAN 56
2018	Ethiopia	ET 05
2018	Korea, Democratic People's Republic	DPRK 31-32
2018	Mozambique	MOZ 16-17
2018	Turkey	TU25
2019	Algeria	ALG 17
2019	Belgium	BL 28-29
2019	Cuba	CUB 39
2019	China, People's Republic of	PRC 35
2019	Djibouti	DJ 15
2019	India	IN 25
2019	United Nations (NY)	UNNY 11
2020	Belize	BE 05
2020	Indonesia	IND 26
2020	Kiribati	KIR 04
2020	Sri Lanka	SRL 26
2020	St. Thomas & Prince Is.	STT 07
2020	Sierra Leone	SIL 22
2020	Tajikistan	TAD 06
2020	Tunisia	TUN 43

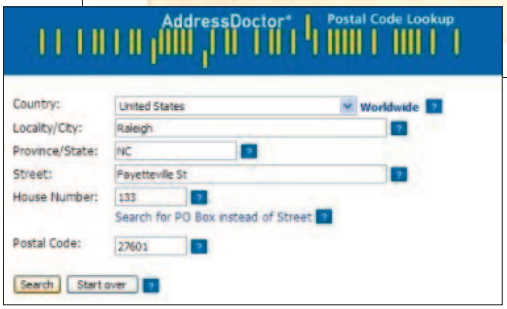
---------- LED circuit

The basic ***LED circuit*** is an electrical circuit used to power a ***L**ight **E**mitting **D**iode*.

Year	Country	Cat. No.
1974	Mexico	MEX 06
1984	Venezuela	VNZ 10
1986	Singapore	SIN 12-13
1987	Australia	AU 11
1987	Australia	AU 14
1989	Luxemburg	LUX 04
1989	USA	USA 26
1991	Algeria	ALG 03
1992	USA	USA 27

---------- Catalog by categories M





1995	USA	USA 32
1998	Brunei	BR 10
2000	Mozambique	MOZ 07
2004	Canada	CAN 49
2004	China, Hong Kong	HK 25
2005	Israel	IL 33
2007	Libya	LIB 15
2009	Netherland	NL 59-60
2012	Romania	RO 40

---------- MAILGRAM

Long distance communication - ***MAILGRAM*** is a mail which is printed, transmitted and reconstituted electronically via computer and WESTAR communications satellite (built by Western Union Company, launched April 13rd, 1974, Kennedy Space Center, Florida, USA). This service was introduced in USA in September 6th, 1974 and stopped as of August 17th, 2006.

Year	Country	Cat. No.
1975	USA	USA 10

---------- Mailing systems solutions

Mailing systems solutions includes mailing machines, postage meters, folders / inserters, address printers and mailroom software.

MOB system - ***M****icro* - ***O****rdinateur de* ***B****ureau*, French system, introduced in 1984 are printing the requested value, the date and hour. The system being spread in other countries too.

AddressDoctor, Saudi Arabia postal code solution provides easy-to-use application for the validation of address for more than 240 countries.

You only need *Internet* access and a free *AddressDoctor* account.

Year	Country	Cat. No.
1998	Venezuela	VNZ 21
1998	Venezuela	VNZ 26
1999	Salvador	SAL 07
2006	Saudi Arabia	SAA 06

---------- Mainframe

Mainframe are computers used mainly by large organizations for critical application, typically bulk data processing such as census, industry and consumer statistics, ERP - **E**nterprise **R**esource **P**lanning, and financial transaction processing.

The term *mainframe* indicates also the early computers of 1940's and 1950's such as Zuse Z3, Atanassoff-Bery Computer (ABC), Colossus, Harvard Mark I, ENIAC, UNIVAC, EDVAC and others.

Year	Country	Cat. No.
1966	Germany, DDR	DDR 10
1972	Ivory Coast	IVC 01
1974	Germany, DDR	DDR 20
1976	China, People's Republic of	PRC 04
1977	Dominican Republic	DOR 01
1977	Romania	RO 15
1978	Comoros Is.	COM 07
1978	Comoros Is.	COM 09
1978	Portugal	POR 05
1979	China, Republic of	ROC 07
1981	China, Republic of	ROC 08
1982	Singapore	SIN 08
1983	St. Lucia	STL 01
1984	Oman	OM 02
1985	Djibouti	DJ 06
1985	Mali	MA 11

1986	St Kitts	STK 01
1986	Soviet Union	USSR 54
1989	Sri Lanka	SRL 03
1992	Congo, People's Republic of	CPR 04
1993	Madagascar (Malagasy Republic)	MDG 11
1994	Nicaragua	NIC 10
1998	Hungary	HU 31
1998	Marshall Islands	MAR 03
1999	Dominica	DOM 05
2000	Central African Republic	CEA 28
2000	China, People's Republic of	PRC 18
2001	B&H Croat Admin.	BHC 02
2001	Bulgaria	BUL 24
2003	Hungary	HU 36
2007	Sri Lanka	SRL 21
2010	Germany	D27
2015	Great Britain	GB 27
2015	Great Britain	GB 30
2017	China, People's Republic of	PRC 31
2017	Japan	J 24
2018	Brazil	BZ 50

---------- Mechanical age

Many scientists have looked for better and faster ways to complex calculations. Initially the search was for mechanical solutions to the problem of adding and subtracting numbers.

The earliest form of a ***rudimentary adding machine*** is a technical drawing found in Leonardo de VINCI's (1452-1519) recently discovered papers, the *Codex Madrid I*. Obviously Da Vinci was not only a painter, but also an engineer, inventor, astronomer, architect and brilliant mechanic. Da Vinci's stepped gearing wheel machine was the first scientific attempt to construct a mechanical calculator. In 1988 IBM arranged a replica of Da Vinci's machine to build.

Calculating clock, built in 1623 by Wilhelm SCHICKARD, was actually the first calculator. However, common knowledge of this device did not exist in scientific community until 1957 (see chapter calculating tool).

Pascaline - a mechanical adding machine, built (1642) by Blaise PASCAL (1623-1662). Eight of Pascaline machine still exist today. One of those is displayed at the Mathematics Museum in Dresden. The *Pascaline* was a 5-digit calculator about the size of a shoebox.

Its mathematical capabilities were however limited in that it could only perform additions. As it had a tendency to jam, it did not become a commercial success and only about 10 were sold.

---------- Catalog by categories M

A calculating machine - ***Stepped Reckoner*** (1671) designed by G. W. LEIBNITZ (1646-1716), extended the use of *Pascaline* by adding more complex multiplication and division capabilities. This machine able to perform the four basic arithmetic functions, using a hand cranked rotating drum with a stepped cylindrical gear. It is not built until 1694.

JACQUARD loom invented in 1801 by French mechanical designer Joseph Marie JACQUARD (1752-1834) based on perforated cards. He introduces in 1806 his first realization of automation of a production process. The *JACQUARD loom* became the first programmable device to be perfected. The punched card controlling the *JACQUARD loom* would later be used to drive the tabulators and ultimately the first computers.

Cylindrical adding machine (1820-1822) made by Johann Christophe SCHUSTER (1759-1823). This object is on the last testimonies of pre-industrial era of mechanical calculation.

Differential Engine (1820-1830) and ***Analytical Engine*** (1830-1870), designed and built by Charles BABBAGE (1791-1871). The lack of financial up port and the technical limitations of the time prevented the machines from becoming operational. In 1991 a more complete version of the *Analytical Engine* was completed and piloted in London. It worked without error.

ORIGINAL ODHNER - adding and listing machine (1870) developed by a Swede engineer Willgodt Theophile ODHNER (1845-1905), whose uniqueness was in its internal mechanism and that numbers were entered using levers. The machine, with various technical improvements along the way, was used for almost 100 years. Over the patent from ODHNER, BRUNSVIGA - MASCHINENWERKE A.G. manufactured ten thousands of those machines.

Tabulating machine (1884) is based on Herman HOLLERITH's (1860-1929) idea of representing logical and numerical data by holes of punched cards, an extended concept of punched cards. Hollerith's idea was to enter the data on punched cards and then to read and tabulate the data on those cards with a machine. Electrical sensing of the holes did this.

H. Hollerith was hired to supervise the 1890 census. For many years the punched cards were used on various HOLLERITH machines

and thus it became natural to also use them with computers.

First workable adding and listing machine patented (1885) and built by William Seward BURROUGHS, in St. Louis, Missouri. In 1904 the Burroughs Adding Machine Co. moved in Detroit, Michigan.

Standard adding machine, in the USA, was developed in the 1890's and was the first ten-key. Four different models were built and manufactured by COMPUTING SCALE Co.

CURTA - adding machines was developed by Curt HERZSTARK while imprisoned in Buchenwald concentration camp. The first *CURTA* was produced in 1947 and has been popular ever since. Even today a *CURTA* is a prized possession.

Mechanical Turk or ***Automaton Chess Player***, in the Hungary, was developed in 1769 by Wolfgang von KEMPELEN (1734-1804)

Antikythera mechanism built around 87 BC. The bronze artifact was recovered in 1901 from a Roman shipwreck near the island of Antikythera in Greece. Recent computer-enhanced imaging studies showed it to be an intricate gear-driven analog computing device used for calculating and displaying astronomical cycles. With its at least 3D hand-cut bronze gears it is a most remarkable machine as the next gear-driven device appears more than one thousand years later.

Nebra Sky Disk is another astronomical instrument dating back 1600 BC. The analog device was possibly used to compute summer and writer solstices.

Year	Country	Cat. No.
1908-9	USA	USA 00
1926	Germany	D 01
1932	Italy	IT 01-02
1932	Italy, Aegean Is.	ITA 01-02
1932	Italian Colonies	ITC 01-02
1932	Latvia	LV 01-01a
1934	France	FR 03
1935	Italy	IT 04
1938	Italy	IT 05
1944	France	FR 04
1947	Austria	OS 01
1948	Liechtenstein	LIE 01
1950	Germany, DDR	DDR 01
1952	France	FR 06
1952	Germany, DDR	DDR 02
1952	Hungary	HU 04
1952	Italy	IT 09

---------- Catalog by categories M

1952	Italy, Trieste Zone A	ITTA 01
1952	Poland	PL 01
1952	Romania	RO 02
1962	France	FR 09
1965	Denmark	DK 02
1965	Iraq	IRQ 01
1966	Paraguay	PAR 10-11
1966	Germany, FRG	FRG 01
1966	Romania	RO 07
1969	Albania	ALB 01
1969	Monaco	MON 02
1970	Niger	NIG 02
1970	Niger	NIG 05
1972	Dubai	DUB 01
1972	Togo	TOG 01
1973	Monaco	MON 03
1974	Hungary	HU 09a
1975	Malta	MAT 02
1977	Mali	MA 07
1978	Zaire	ZAI 01
1980	Germany, FRG	FRG 07
1983	San Marino	SAN 03
1985	Zaire	ZAI 05-06
1989	Madagascar (Malagasy Republic)	MDG 06
1991	Great Britain	GB 08
1994	Slovakia	SLV 00
1996	Albania	ALB 07
1996	Cuba	CUB 13
1996	Germany	D 10
1997	Italy	IT 27
1999	Togo	TOG 09a
2000	Central African Republic	CEA 26-27
2000	Gabon	GA 14
2002	Bosnia & Herzegovina Croat Admin.	BHC 03
2002	Egypt	EGY 09
2002	Germany	D 20
2002	Macedonia, North of ~	MK 05
2002	Monaco	MON 14
2002	Romania	RO 28
2004	Uruguay	UR 17
2006	Greece	GR 06
2006	Liechtenstein	LIE 08
2007	Bosnia & Herzegovina Serb Admin.	BHS 03
2007	Guinea Bissau	GUS 09
2008	Germany	D 26
2008	Malawi	MLW 11
2008	St. Thomas and Prince Is.	STT 04
2009	Guinea, Republic	GUR 13
2012	Germany Private Post - CITI POST	DPP 01

---------- Microchip

Microchips is a group of integrated circuits that can used together to serve a single function.

Year	Country	Cat. No.
1987	Canada	CAN 15
1988	Luxemburg	LUX 03
1989	Antigua & Barbuda	ANT 01
1989	Great Britain	GB 06
1994	Norway	NOR 04
1996	China, People's Republic	PRC 09
1998	Marshall Islands	MAR 05
2000	Malaysia	MLY 19
2000	Mauritius	MAS 05
2000	Peru	PER 05
2000	San Marino	SAN 06
2000	Togo	TOG 12
2001	France	FR 34
2001	Pitcairn Islands	PIT 07
2004	Brazil	BZ 41
2004	Malaysia	MLY 28
2004	Yemen, Republic of	YR 01
2006	Korea, South	SK 28
2009	Cuba	CUB 26
2010	Great Britain	GB 23
2010	Israel	IL 43
2011	Romania	RO 39
2020	Tuvalu	TUV 05

---------- Microcomputer

Microcomputer contains a microprocessor (a central processing unit on a microchip), memory in the form of read-only memory and random access memory, I/O ports and a bus or interconnecting wiring system, housed in a unit that is usually called motherboard. The appearance of microprocessors in 1971 led to unprecedented development of the first commercial microcomputer MICRAL-N (May 1973, R2E - *Réalisations études électroniques*, France), based on a microprocessor Intel 8008. Thi TROUNG (1936-2000) develop the hardware and Philippe KAHN (1952-) the software for this microcomputer. In June 1973, the *word microcomputer* is using for the first time in American newspaper in a paper concerning MICRAL.

At the International Fair in Bucharest - TIB 1974 (October 1974) the microcomputer MICRAL-N is offer to buying.

Year	Country	Cat. No.
1982	Grenada	GRE 03

---------- Catalog by categories M

1983	Germany, DDR	DDR 28
1985	Dominica	DOM 03
1986	Gabon	GA 05
1987	Germany, DDR	DDR 34
1999	Marshall Islands	MAR 06
2001	Cambodia	CA 07
2002	Aruba	ARU 02
2011	Mozambique	MOZ 10
2011	Mozambique	MOZ 12
2019	Great Britain	GB 30

---------- Microprocessor

The ***microprocessor*** (1971, USA) led to the development of the microcomputer and personal computer. Before the invention of *microprocessor*, computer were huge slow machines, putting hundreds of thousands of electronic components on single silicon chip made the computer, smaller, cheaper and faster.

Year	Country	Cat. No.
1984	Gibraltar	GIB 03
2000	Central African Republic	CEA 31
2000	Gabon	GA 12
2000	Zambia	ZAM 03
2001	Romania	RO 26
2011	Korea, South	SK 38

---------- Millenium bug

Millennium bug or the *Year 2000 bug* (also known as *Y2K*) raises problems for anyone who depends on a program in which the year is represented by a two-digit number, but not by four-digit. *00*, the same with year 1900, represents such year 2000.

Year	Country	Cat. No.
2000	Liberia	LBR 02
1999	Indonesia	IND 14
2000	Bangladesh	BAN 06-08
2000	Gabon	GA 15
2000	Israel	IL 24
2000	Morocco	MOR 06
2000	Nevis	NEV 03

---------- Minicomputer

Minicomputer is a computer of an intermediate size between a microcomputer and mainframe, designed for small and intermediate-sized companies. DEC (1970) and IBM (1984) produces minicomputer technology.

Year	Country	Cat. No.
1980	Central African Republic	CEA 07
1980	Christmas Island	CHM 02

1986	Romania	RO 18
2018	Brazil	BZ 49

---------- Mobius strip

A ***Mobius strip*** is a surface with only one side and one edge. It is formed by turning one end of a rectangular strip 180^0 and then attaching it to other end.

The use of the *Mobius strip* for computers is minimal, but ingenious. Before PC became common, office workers often used time / sharing video terminals and low cost printers, which provided paper output. Some of these printers used a removable cartridge with a cloth ribbon in the form of a *Mobius strip*.

Year	Country	Cat. No.
1967	Brazil	BZ 01
1969	Belgium	BL 03
1969	Luxemburg	LUX 01
1969	Netherland	NL 03
1973	Brazil	BZ 03
1974	Brazil	BZ 04
1974	China, Republic of	ROC 04
1974	Switzerland	CH 04
1974	Soviet Union	USSR 24
1997	Israel	IL 04
1977	Korea, South	SK 03
1982	Thailand	THI 05
1988	Saudi Arabia	SAA 02
1993	Netherland	NL 30
2016	New Caledonia	NWC 17

---------- Money cards

A ***money card*** is a system of payment named after the small plastic card issued to users of the system. Most money cards are issued by local banks or credit unions, and are the same shape and size, as specified by the ISO 7810 standard.

At the end of the last century telephone stamps were used, now it is money cards or phone cards.

Year	Country	Cat. No.
1897	France	FR 01
1900-06	France	FR 02
1989	Yugoslavia	YU 07
1990	Yugoslavia	YU 09
1991	Yugoslavia	YU 11
1992	Bosnia & Herzegovina Serb admin.	BHS 01
1994	Latvia	LV 03
1996	China, Republic of	ROC 26

1996	Yugoslavia	YU 12
2001	France	FR 34
2001	China, Macao	MAC 11
2002	Singapore	SIN 32
2004	Brazil	BZ 41
2004	Singapore	SIN 38
2006	China, People's Republic of	PRC 23
2011	Luxemburg	LUX 16
2016	China, People's Republic	PRC 27A
2019	China, Republic of	ROC 43
2019	Germany	D 34

---------- Motherboard

A ***motherboard*** is the central or primary *printed circuit board* making up a complex electronic system, such as a modern computer.

Year	Country	Cat. No.
2000	South Africa	RSA 03
2001	Pitcairn Islands	PIT 06
2017	Togo	TOG 13

---------- Network

A computer ***network*** is a group of interconnected computers. Computers are connected between them, locally or remotely, this enabling a user connected to one computer to use data, programs, central processing unit power and other computers on the *network*.

Network may be classified according to a wide variety of characterizes. Based on the scales *networks* can be classified as *PAN* - **P**ersonal **A**rea **N**etwork, *LAN* - **L**ocal **A**rea **N**etwork, *WAN* - **W**ide **A**rea *N*etwork, **MAN** - **M**etropolitan **A**rea **N**etwork, etc. Based on connection method *networks* can also be classified according to the hardware technology that is used to connect the individual devices in the *network* such as *optical fiber, Ethernet, wireless LAN, home PNA* or *power line communication*.

Year	Country	Cat. No.
1980	Bulgaria	BUL 06
1983	Argentina	AR 04
1983	St. Lucia	STL 01
1988	Germany, FRG	FRG 14
1988	Iceland	IC 03
1991	Indonesia	IND 07
1991	Viet Nam	VIT 04-05
1997	Indonesia	IND 13

1998	Thailand	THI 27
1999	Palau	PAL 08
2000	Great Britain	GB 18
2001	Brunei	BR 17
2001	China, Republic of	ROC 35
2008	Portugal	POR 32
2009	Israel	IL 40
2015	Estonia	EES 03

---------- Notebook

See *laptop*.

---------- Numerical control

Numerical control (NC) refers to the automation of machine tools that are operated by abstractly programmed commands encoded on a storage medium, as opposed to manually controlled via hand wheels or levers or mechanically automated via cams alone. The first *NC* machines were built in the 1940s and 50s, based on existing tools that were modified with motors that moved the controls to follow points fed into the system on paper tape. These early servomechanisms were rapidly augmented with analog and digital computers, creating the modern ***computer numerical controlled (CNC)*** machine tools that have revolutionized the design process. In modern *CNC* systems, end-to-end component design is highly automated using CAD / CAM programs. The programs produce a computer file that is interpreted to extract the commands needed to operate a particular machine, and then loaded into the *CNC* machines for production.

Year	Country	Cat. No.
1960	Soviet Union	USSR 04
1975	France	FR 15
1979	Germany, DDR	DDR 26
1980	Spain	ESP 06
2010	Korea, Democratic People's Republic	DPRK 28
2010	Korea, Democratic People's Republic	DPRK 30

---------- Organizations

IFAC - ***I****nternational* ***F****ederation of* ***A****utomatic* ***C****ontrol*, founded in September 12, 1957, is a worldwide organization dealing with Automatic Control theory, application, education, and anyone of its technical and social implications. The 1st Congress of *IFAC*, organized in Moscow (USSR) between June 26 and July 2, 1960.

The *IFAC* Secretariat has a permanent home. By invitation of the Austrian Government it has been situated in Laxenburg near Vienna (Austria), since 1978.

Year	Country	Cat. No.
1960	Soviet Union	USSR 03

IFIP - ***I****nternational* ***F****ederation for* ***I****nformation* ***P****rocessing*, is an umbrella organization for national societies working in the field of *information technology*. It is a non-governmental, non-profit organization with offices in Austria. Its members include over 48 national societies and academies of science.

IFIP was established in 1960 under the auspices of UNESCO, under the name **I**nternational **F**ederation of **I**nformation **P**rocessing **S**ocieties (IFIPS); the name was changed in 1961. The original contributions of *IFIP* was the definition of *ALGOL 60* programming language, which was one of the first examples of truly international collaboration in computer science and left a durable mark on the entire field.

Year	Country	Cat. No.
1980	Japan	J 05
1998	Hungary	HU 32

---------- Palmtop

See *Personal Digital Assistants - PDA.*

---------- Personal computer (PC)

Personal computer or ***home computer*** replaced the word *microcomputer*, in the late 1980's. A modern *PC* has the power of a computer that 1970's needed a big air-conditioned room. The *PC* consists of system unit, display, keyboard, mouse, hard disk / floppy disk / compact disk drives. The first IBM PC's had single or dual floppy (360 KB) disk drives. Its memory size was usually 640 KB or less.

Year	Country	Cat. No.
1982	Great Britain	GB 03
1983	Uganda	UG 03
1984	Netherland Antilles	NEA 04
1985	Bangladesh	BAN 01
1985	Chad	CHD 09
1985	Djibouti	DJ 05
1985	Netherland Antilles	NEA 05
1986	Brunei	BR 05
1986	Italy	IT 21
1986	Soviet Union	USSR 53
1987	Austria	OS 07-07b
1987	Germany, DDR	DDR 33

1987	Greece	GR 02
1987	India	IN 02
1987	Madagascar (Malagasy Republic)	MDG 04
1987	Sri Lanka	SRL 02
1988	Brazil	BZ 17
1988	China, Republic of	ROC 19
1988	Iran	IRA 04
1988	Israel	IL 08
1988	Italy	IT 22
1988	Netherland Antilles	NEA 10
1988	Poland	PL 15
1989	Germany, DDR	DDR 37
1989	Israel	IL 10
1989	Korea, South	SK 10
1989	Tunisia	TUN 13
1990	Israel	IL 12
1990	Netherland	NL 21
1990	Yugoslavia	YU 08
1991	China, Hong Kong	HK 05
1991	China, Republic of	ROC 22
1991	Ecuador	EQ 08
1991	Liechtenstein	LIE 05
1991	Monaco	MON 10
1991	Sri Lanka	SRL 06
1992	Algeria	ALG 04
1992	Brazil	BZ 21
1992	Guinea, Republic	GUR 02
1992	Hungary	HU 29
1992	Moldova	MD 02
1992	Pakistan	PAK 02-03
1992	Senegal	SEN 09
1992	United Nations (Geneva)	UNG 05
1992	United Nations (NY)	UNNY 05
1992	United Nations (Vienna)	UNW 03
1993	Cyprus, Turkish Republic of Northern	CYT 02
1993	India	IN 04
1993	Mauritius	MAS 04
1993	Philippines	PH 04
1993	Sri Lanka	SRL 07
1993	Uganda	UG 05
1993	United Nations (Geneva)	UNG 06
1993	Uruguay	UR 07
1994	Iran	IRA 08
1994	Israel	IL 17
1994	Malaysia	MLY 07
1994	New Caledonia	NWC 04
1994	Singapore	SIN 19
1994	Sri Lanka	SRL 09
1994	St Kitts	STK 03
1994	Uruguay	UR 09
1995	Brazil	BZ 24
1995	Italy	IT 26

---------- Catalog by categories P

1995	Madagascar (Malagasy Republic)	MDG 13
1995	Maldives Is.	MLV 08
1995	Philippines	PH 05
1995	Senegal	SEN 10
1995	Pitcairn Islands	PIT 02
1995	Sierra Leone	SIL 06
1995	Thailand	THI 18
1996	Bahamas	BAH 02
1996	Bangladesh	BAN 04
1996	Brunei	BR 09
1996	China, Republic of	ROC 27
1996	China, Republic of	ROC 29
1996	Egypt	EGY 04
1996	Korea, Democratic People's Republic	DPRK 14
1996	Libya	LIB 07
1996	Norway	NOR 05
1996	St Vincent	STV 06
1996	St Vincent	STV 09
1996	Syria	SY 05
1996	Virgin Islands, British	VIS 01
1997	Andorra, Spanish	ANS 01
1997	Barbados	BAR 05
1997	China, Hong Kong	HK 09
1997	China, Republic of	ROC 30
1997	Gambia	GAM 03
1997	Great Britain - Guernsey	GBG 05
1997	Iran	IRA 09
1997	Iran	IRA 11
1997	Libya	LIB 09-10
1997	Niger	NIG 13
1997	Palau	PAL 02
1997	Romania	RO 22
1997	Salvador	SAL 05
1997	Thailand	THI 21-22
1997	Thailand	THI 24-25
1997	Uruguay	UR 11
1997	Viet Nam	VIT 08
1998	Argentina	AR 08
1998	Bolivia	BOL 03
1998	Canada	CAN 33
1998	China, People's Republic of	PRC 15
1998	China, Republic of	ROC 33
1998	Denmark	DK 07
1998	Djibouti	DJ 09
1998	Fiji	FJ 04
1998	Malaysia	MLY 10
1998	Mongolia	MOG 11
1998	Mozambique	MOZ 06
1998	Nepal	NEP 02
1998	Netherland	NET 28
1998	Russian Federation	RU 01
1998	South Africa	RSA 02

1998	Spain	ESP 12
1998	Thailand	THI 26
1998	Venezuela	VNZ 19
1998	Venezuela	VNZ 24
1998	Virgin Islands, British	VIS 02
1999	Argentina	AR 09
1999	Azerbaijan	AZ 01
1999	Bangladesh	BAN 05
1999	Barbados	BAR 07
1999	Brazil	BZ 33
1999	British Antarctic Territory	BAT 03
1999	Brunei	BR 12
1999	Chile	CHI 02
1999	China, Macao	MAC 05
1999	Dominican Republic	DOR 04-05
1999	Ireland	IRL 08
1999	Israel	IL 23
1999	Kiribati	KIR 02
1999	Korea, Democratic People's Republic	DPRK 17
1999	Malaysia	MLY 12
1999	Malta	MAT 06
1999	Mexico	MEX 22
1999	Pakistan	PAK 05-06
1999	Papua New Guinea	PNG 06-07
1999	Pitcairn Islands	PIT 03
1999	Portugal	POR 13
1999	Portugal	POR 14
1999	Salvador	SAL 06
1999	Singapore	SIN 24
1999	Slovakia	SLV 04
1999	Slovenia	SLO 07
1999	St Kitts	STK 04-05
1999	Tanzania	TAN 05
1999	Tunisia	TUN 19
1999	United Arab Emirates	UAE 03
1999	Zimbabwe	ZIM 02
2000	Angola	ANG 01
2000	Angola	ANG 04
2000	Bangladesh	BAN 06-08
2000	Barbados	BAR 08
2000	Brunei	BR 13-14
2000	Chile	CHI 05
2000	Gabon	GA 12
2000	Ecuador	EQ 09
2000	Indonesia	IND 18
2000	Israel	IL 24
2000	Faeroe Islands	FAR 02
2000	Maldives Islands	MLV 08-10
2000	Marshall Islands	MAR 09
2000	Mauritania	MAU 12
2000	Mexico	MEX 23
2000	Mexico	MEX 26
2000	Mexico	MEX 28

---------- Catalog by categories P

2000	Mexico	MEX 29
2000	Moldova	MD 04
2000	Nauru	NAU 02-03
2000	Philippines	PH 11
2000	Pitcairn Islands	PIT 04
2000	Portugal	POR 20
2000	Salvador	SAL 08
2000	San Marino	SAN 05
2000	San Marino	SAN 08
2000	Sri Lanka	SRL 12
2000	Sri Lanka	SRL 14
2000	Tanzania	TAN 06
2000	Tunisia	TUN 22
2000	Uruguay	UR 13
2000	USA	USA 46
2001	Angola	ANG 07
2001	Belgium	BL 16
2001	Ecuador	EQ 10
2001	French Southern & Antarctic Lands Territory	TAAF 09-10
2001	Israel	IL 30
2001	Japan	J 15
2001	Mauritius	MAS 06
2001	Mexico	MEX 33
2001	Mongolia	MOG 16
2001	Mozambique	MOZ 08
2001	Papua New Guinea	PNG 08
2001	Russian Federation	RU 05
2001	Singapore	SIN 29
2001	Syria	SY 08
2001	Tunisia	TUN 23
2001	Tunisia	TUN 25
2001	Uzbekistan	UZ 02
2002	Bolivia	BOL 04
2002	Brazil	BZ 40
2002	Brunei	BR 17
2002	Brunei	BR 18
2002	China, Republic of	ROC 36A
2002	Cuba	CUB 15
2002	Cuba	CUB 16-17
2002	Cyprus	CY 03
2002	Indonesia	IND 20
2002	Libya	LIB 12
2002	Namibia	NAM 02
2002	Namibia	NAM 04-05
2002	Romania	RO 29
2002	Russian Federation	RU 07
2002	Salvador	SAL 09
2002	Sudan	SU 02-03
2003	Egypt	EGY 11
2003	Hungary	HU 37
2003	Korea, Democratic People's Republic	DPRK 20
2003	Malaysia	MLY 26

2003	Moldova	MD 07
2003	Pakistan	PAK 10
2003	Saint Vincent	STV 17
2003	Tunisia	TUN 26
2004	Azerbaijan	AZ 03
2004	Egypt	EGY 14
2004	India	IN 14
2004	Ivory Coast	IVC 07
2004	Kazakhstan	KAZ 03
2004	Malaysia	MLY 28
2004	Mauritius	MAS 08
2004	Peru	PER 07
2004	Singapore	SIN 40
2004	Sri Lanka	SRL 18
2004	Tanzania	TAN 07
2004	Thailand	THI 34
2004	Tristan da Cunha	TDC 01
2005	Angola	ANG 08
2005	Cuba	CUB 18
2005	Egypt	EGY 16
2005	Mauritius	MAS 09
2005	New Zealand	NWZ 12
2005	Norway	NOR 10
2005	Oman, Sultanate of	OM 06
2005	Tunisia	TUN 31
2005	USA	USA 56
2005	Venezuela	VNZ 29
2006	Azerbaijan	AZ 05
2006	Bangladesh	BAN 11
2006	Barbados	BAR 09-10
2006	Chile	CHI 07
2006	Korea, Democratic People's Republic	DPRK 21
2006	Liberia	LBR 03
2006	Tunisia	TUN 33
2006	Tunisia	TUN 35
2006	Uzbekistan	UZ 04
2007	Bolivia	BOL 06
2007	Botswana	BOT 04
2007	Brazil	BZ 43
2007	British Antarctic Territory	BAT 04
2007	Cuba	CUB 20
2007	Cuba	CUB 23
2007	Cuba	CUB 24
2007	Dominican Republic	DOR 09
2007	Israel	IL 38
2007	Japan	J 23
2007	Libya	LIB 14
2007	Netherland	NL 56
2007	Saudi Arabia	SAA 07
2007	Sri Lanka	SRL 22
2007	Tunisia	TUN 37
2008	Azerbaijan	AZ 07
2008	North Korea	DPRK 23

---------- Catalog by categories P

2008	Korea, South	SK 36
2008	France	FR 42
2008	Iran	IRA 14
2008	New Caledonia	NWC 11
2008	Portugal	POR 34
2008	Swaziland	SWA 05
2009	Cambodia	CA 08
2009	Ghana	GH 12
2009	Guinea Bissau	GUS 13
2009	Kenya	KEN 04
2009	Korea, Democratic People's Republic	DPRK 25
2009	Morocco	MOR 10
2009	Slovenia	SLO 15-16
2009	Sri Lanka	SRL 23
2009	South Africa	RSA 10
2009	Tanzania	TAN 08
2009	United Arab Emirates	UAE 06
2010	Indonesia	IND 23
2010	South Africa	RSA 11
2010	Uzbekistan	UZ 05
2010	Venezuela	VNZ 32
2010	Viet Nam	VIT 20
2011	Algeria	ALG 14
2011	Thailand	THI 41
2011	United Nations (Geneva)	UNG 09
2013	Micronesia	MIC 09
2013	Tajikistan	TAD 05
2015	Bermuda	BEM 02
2015	Maldives Is.	MLV 13
2015	Thailand	THI 45
2015	Trinidad & Tobago	TRT 07
2016	Cuba	CUB 33-33a
2016	Slovenia	SLO 19
2016	Djibouti	DJ 11-13
2017	Moldova	MD 13
2017	New Zealand	NWZ 15
2020	Belize	BE 04
2020	Sierra Leone	SIL 23

---------- Personal Digital Assistants

Personal Digital Assistants - PDA is *one hand-design* device (1993). Is called handheld or ***palmtop***. The light-weight, robust yet small goes-anywhere device that helped people manage and organize their personal and professional lives by providing instant, anytime access to schedules, important phone numbers, to-do lists and other key information. It combines much more functionalities: telephone, networks functions as access to the Internet, reading and sending e-mails, office programs as word processor and spreadsheet, the ability to synchronize data with personal computers.

The next step of PDA is ***iPAD*** (2010) developed for by used in the business, education, healthcare, and technology sectors. There are two variants of iPad; one has only Wi-Fi and one has support for cellular networks. Accessories include the Apple Pencil, Smart Case, Smart Keyboard, Smart Keyboard Folio, Magic Keyboard, and several adapters.

Year	Country	Cat. No.
2000	Mauritania	MAU 12
2001	China, Macao	MAC 12
2001	China, Republic of	ROC 36
2002	Thailand	THI 32
2003	Netherland	NL 52
2005	Thailand	THI 37
2006	Malaysia	MLY 29
2008	Portugal	POR 32
2011	Bangladesh	BAN 11
2012	Netherland	NL 68b
2012	Thailand	THI 42
2013	Gibraltar	GIB 06
2013	Singapore	SIN 50
2015	Bolivia	BOL 08
2015	Thailand	THI 45
2015	Trinidad & Tobago	TRT 07
2017	Cuba	CUB 36
2017	Thailand	THI 46
2016	New Caledonia	NWC 17
2018	St. Tome & Principe Is.	STT 06
2019	Egypt	EGY 21
2020	Indonesia	IND 26
2020	Japan	J 26
2020	Sierra Leone	SIL 24
2020	Tuvalu	TUV 05

---------- Personalities

Mohamed ben Muja ALKARISMI (ca. 780-850), Persian mathematician, laid the foundation for all medieval Arabic and European Algebra. The world *algorithm* (a set of well - defined rules for solution of a problem in a finite numbers of steps) is derived from his name. Software algorithms define the procedure a program takes to solve a problem.

Year	Country	Cat. No.
1983	Soviet Union	USSR 44
2008	Saint Thomas and Prince Is.	STT 03
2009	Guinea Bissau	GUS 15

John ATANASOV (1903-1995) together with Clifford BERRY built the *ABC - **A**tanasov-**B**erry **C**omputer)*, the world's first electronic-digital computer at Iowa State University between 1939 and 1942. It used vacuum tubes and had a sped of one addition per second. In 1973, Atanasov was judged by the U.S. Supreme Court to be true inventor of the electronic computer.

---------- Catalog by categories P

Year	Country	Cat. No.
2001	Bulgaria	BUL 24
2003	Bulgaria	BUL 26

Charles BABBAGE (1791-1871), England, mathematician and astronomer, is best known for his work on *Differential Engine* and the *Analytical Engine*, major steps in the development of the modern computer.

Year	Country	Cat. No.
1991	Great Britain	GB 08
2007	Guinea Bissau	GUS 09
2010	Great Britain	GB 23

John BARDEEN (1908-1991), USA, theoretical physicist, shared the Nobel Prize in Physics twice as co-inventor of the transistor (1956) and for the explanation of superconductivity (1972). Diverse applications of superconductivity currently include infrared sensors and medical imaging systems.

See also *William Bradford SHOCKLEY*

Sabber BATHIA (1968, Dec. 30-) and ***Jack SMITH (1969-)*** were launched in July 1996 world web site *hotmail.com*.

Year	Country	Cat. No.
1999	Palau	PAL 08

Jean Maurice Emile BAUDOT (1845-1903), France, engineer, invented the most revolutionary approach, called *time division-multiplex* (1872). It allowed several messages to be sent simultaneously. Instead of the Morse code used previously, Baudot's approach used a five-bit code he developed. This code is the same one used for 5-hole perforated paper tape. Such paper tape was once a primary medium for entering data into the computer.

Year	Country	Cat. No.
1949	France	FR 05
1965	Chad	CHD 01-02
1965	Dahomey	DAH 01
1993	Gabon	GA 05

Timothy John "Tim" BERNERS - LEE, Sir (1955-) is a British engineer and computer scientist and MIT professor credited with inventing the *WWW - **W**orld **W**ide **W**eb*, making the

first proposal for it in March 1989. On December 25, 1990, with the help of Robert CAILLIAU and a young student at CERN, he implemented the first successful communication between an *HTTP client and server* via the *Internet*.

Berners-Lee is the director of the World *Wide Web Consortium - W3C*, which oversees the Web's continued development. He is also the founder of the *World Wide Web Foundation*, and senior researcher and holder of the *3Com Founders Chair* at the *MIT Computer Science and Artificial Intelligence Laboratory*. In April 2009, he was elected member of the *United State National Academy of Sciences*, based in Washington, DC.

Year	Country	Cat. No.
2000	Marshall Is.	MAR 11
2009	Guinea Bissau	GUS 14
2011	Mozambique	MOZ 11-12
2015	Great Britain	GB 28

Jeffrey P. BEZOS (1964-) born in Albuquerque, New Mexico, USA, and graduated from Princeton University summa cum laude with a computer science degree in 1986. In 1994 he rented a house in Seattle, and set up in his garage *amazon.com*, the world's largest bookstore. This site proving that e-commerce could be successful.

Year	Country	Cat. No.
1999	Palau	PAL 08

Walter Houser BRATTAIN (1902-1987)

See *William Bradford SHOCKLEY*

Serghey BRIN (1973 -), is a Russian-American computer scientist best known as the co-founder of *Google Inc.*

Year	Country	Cat. No.
2009	Guinea Bissau	GUS 14

Wannevar BUSH (1890-1974), built (1925) at Massachusetts Institute of Technology, the first analogue computer, a machine designed to solve differential equations.

Year	Country	Cat. No.
1967	Sweden	SWE 01
1977	Comoro Is.	COM 06
1995	Grenada	GRE 11

Nolan BUSHNELL (1943-) founded in 1971 Atari company, and designed and built in 1973 a tennis video game called *Pong*. Since then, Bushnell has been working on a few new ideas in the computer video games industry.

---------- Catalog by categories P

Year	Country	Cat. No.
1999	Palau	PAL 08

Vinton Gray CERF (1943-), graduated from Stanford in 1965 with a Bachelor's degree in Mathematics. In 1973, he and Robert E. KAHN began working on the *Transmission Control Protocol / Internet Protocol (TCP/IP)*. This was the key to the transmitting and interchange of data over the network. Based on this work the *Internet* was first demonstrated in July 1977.

Year	Country	Cat. No.
2000	Central African Republic	CEA 24-25
2008	Guinea Republic	GUR 11
2009	Malawi	MLW 10

James CLARK (1944-) founded *Silicon Graphics Inc.* and together with Marc ANDREESEN, he founded *Netscape Communication Corporation*. He developed the *Geometry Engine Chip* for use in three dimensional computer graphics. His most recent venture is *myCFO*, an online financial service for high-network customers, and *shutterfly.com*, an online digital photo printing service.

Year	Country	Cat. No.
1999	Palau	PAL 08

Arthur Charles CLARKE, Sir Arthur (1917-2008) graduated in physics and mathematics. His first connection to the world of computers came before that when he wrote an article proposing the idea of a satellite that would circle the earth in 24 hours.

Clarke is best known for 2001: a *Space Odyssey* (1968), which also became a popular film. It features a computer known as HAL, whose name is made up of the letters of IBM. During the filming, he communicated with Peter Hyams (screen writer and director) using modems, communications software, and twin Kaypro 2 computers. This was an effective early application of personal computers.

Through the Arthur Clarke Center in Sri Lanka, Clarke actively promoted microcomputer usage to help developing countries.

Year	Country	Cat. No.
1999	Sri Lanka	SRL 11
2002	Antigua & Barbuda	ANT 07
2008	Guinea Republic	GUR 10
2009	Guinea Bissau	GUS 12

Thomas Alva EDISON (1847-1931), American inventor of the electric light bulb (October 21, 1879), the phonograph, and the motion

picture projector. Later, other inventor used the *Edison effect* to develop the vacuum tube.

Year	Country	Cat. No.
1929	USA	USA 02
1947	USA	USA 03
1948	Hungary	HU 03
1966	Yemen Arab Republic	YAR01
1976	Maldives Is.	MLV 01
1976	Togo	TOG 03-04
1977	Afars & Issas	AFI 01
1977	Djibouti	DJ 01
1978	Togo	TOG 05
1979	Dominican Republic	DOR 02
1980	Uruguay	UR 04
1981	Guatemala	GUA 01
1981	Mexico	MEX 10
1981	Wallis & Futuna	WAF 01
1982	San Marino	SAN 01
1992	Antigua & Barbuda	ANT 02 sheet
1992	Cambodia	CA 04
1993	Barbuda	BAB 02
1993	Madagascar (Malagasy Republic)	MDG 10
1997	Israel	IL 20
1997	Romania	RO 21
1997	Vanuatu	VAN 03
1998	Ghana	GH 08
2000	Ireland	IRL 09
2001	Uruguay	UR 14
2006	Nauru	NAU 04
2009	Guinea, Bissau	GUS 15

Philip EMEAGWALI (1954-), Nigeria, engineer and computer scientist / geologist, who was one of two winners of the *Gordon Bell Prize*, a prize from the IEEE, for his use of a *Connection Machine* supercomputer to help analyze petroleum fields.

Year	Country	Cat. No.
2006	Nigeria	NGR 07

Ahmad ibn Muhammad ibn Kathir al FARGHANI also known as ***ALFRAGANUS*** in the West was a Persian astronomer and one of the famous astronomers in 9th century. Later he moved to Cairo, where he composed a very important treatise on the *astrolabe* (astronomical computer) around 856.

The *Alfraganus* crater on the Moon was named after him.

Year	Country	Cat. No.
1998	Uzbekistan	UZ 01

David FILO (1966-)

See *Jerry YANG*

---------- Catalog by categories P

Galileo GALILEI (1564-1642) was at the University of Padua for 18 years beginning in 1592. While there, he developed and built several mathematical instruments, including a calculating rule that later became known as a *sector*. It is said to have been the most widely used scientific computing device until it was replaced by the *slide rule* in about 1800.

Year	Country	Cat. No.
1933	Italy	IT 03
1942	Italy	IT 06
1945	Italy	IT 08
1964	Czechoslovakia	CZ 03
1964	Italy	IT 10
1964	Hungary	HU 06
1964	Romania	RO 06
1964	Soviet Union	USSR 09
1965	Panama	PAN 01
1965	Paraguay	PAR 08-09
1966	Ecuador	EQ 03
1969	Burundi	BRD 01
1970	Niger	NIG 01
1970	Niger	NIG 04
1971	Ascension	AS 01
1971	Mexico	MEX 04
1979	Comoros Is.	COM 11
1980	Benin	BEN 03
1980	Korea, Democratic People's Republic	DPRK 08
1981	Guinea Bissau	GUS 05
1982	San Marino	SAN 02
1983	Italy	IT 18
1984	Central African Republic	CEA 16
1984	Djibouti	DJ 04
1985	Central African Republic	CEA 16
1986	Cambodia	CA 01
1986	Laos	LAO 10
1986	Lesotho	LST 01
1987	Albania	ALB 04
1988	Comoros Is.	COM 15
1988	Maldives Is.	MLV 07
1990	Sierra Leone	SIL 02
1991	Dominica	DOM 04
1991	Grenada	GRE 09
1992	Antigua & Barbuda	ANT 02
1993	Barbuda	BAB 02
1994	Nicaragua	NIC 08
1994	Vatican City	VAT 02
1995	Italy	IT 25
1997	Chad	CHD 10
1997	Niger	NIG 14
1999	Grenada	GRE 12
1999	Korea, Democratic People's Republic	DPRK 16

1999	Saint Vincent	STV 13
2000	Burundi	BRD 02
2000	Ireland - Eire	IRL 10
2000	Yugoslavia	YU 14
2008	Malawi	MLW 12
2009	Guinea, Bissau	GUS 11
2009	Korea, Democratic People's Republic	DPRK 26
2009	Lithuania	LIT 02
2009	Luxemburg	LUX 11
2009	Malta	MAT 08
2009	Monaco	MON 16
2009	Morocco	MOR 09
2009	Romania	RO 38
2009	Ukraine	UK 07
2009	Uruguay	UR 19
2014	Bosnia & Herzegovina - Serb admin. - Republic of Srpska	BHS 05
2014	Bulgaria	BUL 27

William Henry GATES III (1955-), founded in New Mexico, with Paul ALLEN, the company *MICROSOFT* (the original included a hyphen). The company moved in Seattle in 1979 and, in 1980 IBM contracted with them to provide an operating system for IBM's first personal computer. *MICROSOFT* produced *MS-DOS (**M**icro - S**o**ftware **D**irty **O**perating **S**ystem)*, released in August 1981.

IBM soon realized its mistake but it was too late to stop the birth of a giant.

WINDOWS - MICROSOFT Operating Systems for PC's, was released in November 1985, and is designed for personal or small - office professional or business use.

*OS/2 - **O**perating **S**ystem* for IBM's PC line of second generation was announced in April 1987 and released in December 1987. *OS/2* is a sophisticated multitasking system competing with *MICROSOFT's Windows* in terms of capability and performance.

Year	Country	Cat. No.
1986	Guinea, Republic	GUR 06a
1999	Palau	PAL 08
2008	Guinea, Equatorial	GEQ 03
2009	Guinea Bissau	GUS 14
2011	Guinea, Republic	GUR 14
2013	Niger	NIG 19

William GIBSON (1948 -) was born in Myrtle Beach, South Carolina. He coined the word *cyberspace* in his 1984 novel *Neuromancer*.

---------- Catalog by categories P

Year	Country	Cat. No.
1999	Palau	PAL 08

James GOSLING (1955-) created a language, initially called *Oak*, which was more portable than *C++*. In 1995 the language was renamed *Java*. It is a platform-independent language that facilities the distribution of both data and application programs (called *applets*) over the *Internet*.

Year	Country	Cat. No.
1999	Palau	PAL 08

Andrew Stephen "Andy" GROVE (1936-2016 (Hungarian: Grof Andras Istvan) is a Hungarian American businessman and engineer. He was one of the earliest employees of *Intel Corporation* and ultimately played key leadership role in its success.

Year	Country	Cat. No.
1999	Palau	PAL 08

Patricia Roberts HARRIS (1924-1985), USA, was appointed to the board of directors of IBM (1971), thus becoming the first African-American female director of a major United States Corporation.

Year	Country	Cat. No.
2000	USA	USA 47

Stephen William HAUKING (1942 - 2018), England, theoretical physicist, cosmologist. Hauking achieved commercial success with several works of popular science in which he discussed his theories and cosmology in general. Hauking is a recipient of the Presidential Medal of Freedom, the highest civilian award in the United States.

Year	Country	Cat. No.
2018	Mozambique	MOZ 16-17

Daniel (Danny) HILLIS (1956 -) was born in Baltimore, Maryland, and he graduated from MIT (Massachusetts Institute of Technology in Cambridge) where designed computer-oriented toys and games. In 1985 he designed a massively parallel computer with 64,000 processors, which concept is now the basis for most *supercomputers*.

Year	Country	Cat. No.
1999	Palau	PAL 08

Grace Murray HOPPER (1906-1992), military leader (rear admiral in the U.S. navy),

mathematician, American computer scientist (pioneer in the field of IT), leading the team that developed the first compiler for a computer programming language and created the compiler for one of the first modern computer programming languages - COBOL - which were developed independently from equipment (1959). COBOL - **CO**mmon **B**usiness-**O**riented **L**anguage is one of the first high-level programming languages, defining its primary domain in business, finance, and administrative system for companies and governments.

Year	Country	Cat. No.
2013	Romania	RO 41

Joseph Marie JACQUARD (1752-1834), France, mechanical designer, developed an innovative loom - *JACQUARD loom* (1801) that used holes punched in cards to guide the threads. The resulting *JACQUARD loom* is still being used today, using metal rods to detect holes in punched cards. By 1812, there were 11,000 *JACQUARD looms* in use in France. By 1834, there were 30,000 such looms in use in Lyons alone, and many more all over the world.

Year	Country	Cat. No.
1934	France	FR 03
1947	Austria	OS 01
1999	Togo	TOG 09a

Steven Paul JOBS (1955-2011), USA, businessman, co-founder and CEO of Apple Inc, and former CEO of *Pixar Animation Studios*. In the early 1980s, Jobs was among the first to see the commercial potential of the mouse-driven graphical user interface. Jobs' history in business has contributed greatly to the myths of the idiosyncratic, individualistic Silicon Valley entrepreneur, emphasizing the importance of design and understanding the crucial role anesthetics play in public appeal. His work driving forward the development of products that are both functional and elegant has earned him a devoted following.

Year	Country	Cat. No.
1999	Marshal	MAR 06
1999	Palau	PAL 08
2000	Central African Republic	CEA 31
2003	Pakistan	PAK 10
2007	Guinea, Republic	GUR 09a
2007	Guinea, Republic	GUR 11
2008	Australia	AU 37
2009	Guinea Bissau	GUS 14
2011	Guinea, Republic	GUR 14 -15

---------- Catalog by categories P

2012	Guinea, Republic	GUR 17
2016	Djibouti	DJ 11-13
2020	Tuvalu	TUV 05

Robert E. KAHN (1938 -), USA, defined open architecture networking and wrote BBN's (**B**olt **B**eranek & **N**ewman in Cambridge) proposal for *ARPANet*. In order to get different data transition protocols to work together, KAHN and Vinton G. CERF invented (1973) the *Transmission Control Protocol / Internet Protocol (TCP/IP)*.

TCP/IP is a method used along with the Internet Protocol to send data in the form of message units between computers over the Internet.

Year	Country	Cat. No.
1999	Palau	PAL 08

Karel KAPEK (1890-1923), Czechoslovakian writer, noted for his science fiction including the 1921 satirical play *R.U.R.* (**R**eason's **U**niversal **R**obot), in which he coined the word *robot*.

Year	Country	Cat. No.
1958	Czechoslovakia	CZ 01
1968	Czechoslovakia	CZ 06
1990	Czechoslovakia	CZ 18

Alan Curtis KAY (1940-), American computer scientist. Known for *Dynabook, object-oriented programming, graphical user interface Windows*.

Year	Country	Cat. No.
2008	Guinea, Republic	GUR 12

Wolfgang von KEMPELEN (1734-1804), Hungary. He was most famous for his construction of the *Mechanical Turk or Automaton Chess Player* (1769), a chess-playing automaton later revealed to be a hoax.

Year	Country	Cat. No.
1974	Hungary	HU 09a
1994	Slovakia	SLV 00

Johannes KEPLER (1571-1630), Germany - astronomer, designs the *complex astronomical calculation system*.

Year	Country	Cat. No.
1966	Ecuador	EQ 04
1969	Yemen, Kingdom	YKG 01
1971	Dahomey	DAH 03
1971	Germany, DDR	DDR 14
1971	Mexico	MEX 05
1971	Romania	RO 12
1974	Saint Pierre & Miquelon	STP 02

1980	Benin	BEN 04
1980	Hungary	HU 17
1980	Korea, Democratic People's Republic	DPRK 05
1980	Mali	MA 09
1980	Mongolia	MOG 06
1984	Laos	LAO 06
1988	Comoros Is.	COM 15
1990	Sierra Leone	SIL 02
1991	Grenada	GRE 09
1996	Comoros Is.	COM 25
1999	Korea, Democratic People's Republic	DPRK 16
2009	Czech Republic	CZR 06

Jack St. Clair KILBY (1923-2005) is credited co-inventors of the *integrated circuit*, the key component of third generation computers. In 1967 Kilby, working with Jerry MERRYMAN and James Van TASSEL, also built the first portable, electronic, *hand-held calculator*, their prototype is in the Smithsonian Institution.

Year	Country	Cat. No.
1998	Marshall Islands	MAR 05
1999	Palau	PAL 08

George KLEIN (1904-1992), Canadian scientific, *Canadarm* designer, a robotic arm used in the Space Shuttle of the US space program.

Year	Country	Cat. No.
1999	Canada	CAN 39
2000	Canada	CAN 45

Jaron LANIER (1960-) is a computer scientist, artist, musician and author. He invented *VPL - **V**irtual **P**rogramming **L**anguage* and the term *virtual reality*.

Year	Country	Cat. No.
1999	Palau	PAL 08

Gottfried Wilhelm LEIBNIZ (1646-1716), Germany, philosopher and mathematician, provided many contributions that led to the development of the computer. He provided significant enhancements to the calculator, developed the rules of logic, and wrote about the binary number system.

Year	Country	Cat. No.
1926	Germany	D 01
1950	Germany, DDR	DDR 01
1966	Romania	RO 07
1966	Germany, FRG	FRG 01
1976	Soviet Union	USSR 27-28
1980	Germany, FRG	FRG 07
1988	Soviet Union	USSR 59

---------- Catalog by categories P

1991	Saint Vincent	STV 02
1996	Albania	ALB 07
1996	Germany	D 10
2012	Germany Private Post - CITI POST	DPP 01

Robert M. METCALFE (1946-), invented, in 1973, *Ethernet* which allowed computers to send packets of information to each other resulting in the local area network (LAN) where data and resources could be shared. In 1979 he founded *3Com*, a company that sells commercial version of *Ethernet* and other networking products.

Year	Country	Cat. No.
1999	Palau	PAL 08

Albert Abraham MICHELSON (1852-1931), American Nobel Laureate in Physics (1907), designed and built with Samuel W. SRATTON, an *analogue computer* that could and together up to 20 terms of a complex mathematical formula called the *Fourier series*. A later improved version could handle 80 terms, and produce a graph of the sum function.

Year	Country	Cat. No.
1967	Sweden	SWE 01
1977	Comoro Is.	COM 06
1988	Gambia	GAM 02
1995	Grenada	GRE 11
2009	Guinea Bissau	GUS 16
1993	Madagascar (Malagasy Republic)	MDG 09

Rand MILLER (1959-) and ***Robyn MILLER (1966-)*** formed the company *Cyan Inc.* in 1987. This company created the first *entertainment game* for children on the new medium CD-ROM (**C**ompact **D**isk - **R**ead **O**nly **M**emory), called *The Manhole*.

Year	Country	Cat. No.
1999	Palau	PAL 08

Grigore C. MOISIL (1906-1973), Romanian mathematician, awarded post-mortem by IEEE Computer Society (1996), with the title of *Computer Pioneer*, published the works: *The algebraic theory of switching circuits* (1959), *The algebraic structure of polyvalent logics*.

Year	Country	Cat. No.
2006	Romania	RO 36

Peter NAUR (1928-2016), Danish computer scientist and Turing award winner. Known for *ALGOL 60 programming language and Backus-Naur form*.

Year	Country	Cat. No.
2008	Guinea, Republic	GUR 12

Nicholas NEGROPONTE (1943-) is a Greek-American architect and computer scientist best known as the founder and Chairman Emeritus of *MIT's Media Lab*, and also known as founder of the ***O**ne **L**aptop **P**er **C**hild Association (OLPC)*.

Year	Country	Cat. No.
1999	Palau	PAL 08

John Ludwig von NEUMANN (1903-1957), Hungarian-American mathematician, participated in the development of *ENIAC - **E**lectronic **N**umerator, **I**ntegrator, **A**nalyzer, and **C**omputer* (1944) and *EDVAC - **E**lectronic **D**iscrete **VA**riable **C**alculator* (1944-1945). The scientists responsible for the development of *EDVAC* were John William MAUCHLY, Prosper ECKERT and John von NEUMANN. He published the most important paper ever written on computers, where he provides an excellent analysis of the architecture and operation of a computer. He pointed out the vital components of the modern computing device: central arithmetical, central control, memory, input and output to the recording device, and decimal-binary conversions. He proposed a repertoire of instructions and suggested concept of the stored program (1945).

Year	Country	Cat. No.
1992	Hungary	HU 29
1993	Guyana	GUY 08
1993	Madagascar (Malagasy Republic)	MDG 11
1998	Hungary	HU 31
2000	Portugal	POR 17
2003	Hungary	HU 36
2005	USA	USA 57

Stefan ODOBLEJA (1902-1978), Romania, is a Romanian scientists, the father of *generalized cybernetics*, fundamental work *Psychologie consonnantiste* (1938 - tome I, 1939 - tome II). *Consonnantist* is a word invented by ODOBLEJA, it doesn't have a direct English equivalent. His work preceding by one decade the contents of WIENER's book.

4th International congress of cybernetics and systems (Amsterdam, 1978) acknowledge his merits.

Stefan ODOBLEJA and Norbert WIENER are considered to the *pioneers of cybernetics*.

Year	Country	Cat. No.
2011	Romania	RO 39

---------- Catalog by categories P

Lawrence Edward "Larry" PAGE (1973 -), USA, is an American computer scientist best known as co-founder of *Google Inc.*, the world's largest *Internet* company, based on its search engine and online advertising technology.

Year	Country	Cat. No.
2009	Guinea Bissau	GUS 14

PANINI (c. 520-460 B.C.), Indian scientist, author of *Sanskrit Grammar*. An important landmark of the Vedic period was the work of Sanskrit grammarian of PANINI. His grammar includes early use of Boolean logic, of the null operator, and of context free grammars, and includes a precursor of the *Backus-Naur form* (used in the description programming languages).

His notation was similar to modern mathematical notation, and used metarules, transformations, and recursions with such sophistication that his grammar had the computing power equivalent to a *Turing machin*e.

Year	Country	Cat. No.
2004	India	IN 13

Blaise PASCAL (1623-1662), France, mathematician, philosopher and physicist, built (1642) a mechanical adding machine, the *Pascaline*.

A high-level computer programming language, designed to support structured programming and used in teaching, applications, and systems programming, is named *Pascal* in honor of Blaise Pascal.

Year	Country	Cat. No.
1944	France	FR 04
1962	France	FR 09
1973	Monaco	MON 03
2000	Central African Rep.	CEA 26-27
2001	Cambodia	CA 07
2008	St. Thomas and Prince Is.	STT 04
2009	Guinea, Rep.	GUR 13

Mihailo PETROVIĆ ALAS (1868-1943), Serbian mathematician and inventor. Petrović contributed significantly to the study of differential equations and phenomenology, founded engineering mathematics in Serbia, and invented one of the first prototypes of a hydraulic analog computer - *hydrointegrator*.

Year	Country	Cat. No.
1993	Yugoslavia	YU 11A

2018	Bosnia & Hertzegovina Serb Adm. Republlic of Srpska	BHS 06
2018	Serbia	SRB 07

Valdemar POULSEN (1869-1942), Danish engineer, invented the telegraphone (1898) - an electromagnetic phonograph capable of registering information by alternating the magnetization of a wire. This is the foundation of present magnetic tapes.

Year	Country	Cat. No.
1969	Denmark	DK 04

Jef RASKIN (1943 - 2005), was an American *human-computer interface expert* best known for conceiving and starting the *Macintosh* project at *Apple* in the late 1970s.

Year	Country	Cat. No.
2011	Guinea, Republic	GUR 14

H. Edward ROBERTS (1941-2010), started building the *second microcomputer* of the market ALTAIR 8800 (January 1975 *Popular Electronics* published the first of two articles on the Altair 8800) produced by *MITS - **M**icro **I**nstrumentation and **T**elemetry **S**ystems*, based by Intel 8080 microprocessor. See also the chapter *microcomputer*.

Year	Country	Cat. No.
2001	Cambodia	CA 07
2011	Mozambique	MOZ 10
2011	Mozambique	MOZ 12

Johann Cristoph SCHUSTER (1759-1823), Germany, build the *cylindrical adding machine* (1820-1822). This is one of the rare objects that just pops up in the river of time, in 1993 its discovery meant a small sensation. It is on display in the Arithmeum in Bonn (Germany), a museum dedicated to the science of mathematics and in this context to rare calculators.

Year	Country	Cat. No.
2002	Germany	D 20

Musa Ibn SHAKER Sons is astronomer of 9th century A.C. The most studied work written by this is *The book of the measurement of plane and spherical figures*.

Year	Country	Cat. No.
1996	Syria	SY 06

Werner von SIEMENS (December 13, 1816 - 1892), German inventor, founded in 1847 Siemens company. Werner von SIEMENS, together with Johann George HAKSKE (1814-1890), started a telegraph factory. After HALSKE withdrew from the company, the firm was the left in the hands of the Siemens family. In 1966 it was merged with other family owned firms to become Siemens AG, a leader in European computer industry today. Siemens manufactured everything from electric trains and telephones to, later, computers and washing machines. In October 1999 *Siemens Computers* merged with Japanese *Fujitsu*.

Year	Country	Cat. No.
1952	Germany, Berlin	BER 01
1966	Germany, FRG	FRG 02
1981	South Africa, Bophuthatswana	RSAB 02
1982	South Africa, Bophuthatswana	RSAB 03
1984	South Africa, Bophuthatswana	RSAB 04
1986	Central African Republic	CEA 20
1986	Guinea, Republic	GUR 06
1986	Paraguay	PAR 18
1989	Germany, DDR	DDR 36
1992	Germany	D 03
1992	Guinea, Republic	GUR 04
1989	Central African Republic	CEA 21

Waclaw SIERPINSKI (1882-1969), described the *Sierpinski triangle* (1915), which is *fractal* named after him. Originally constructed as a curve, this is one of the basic examples of self-similar sets, i.e. it is a mathematically generated pattern that can be reproducible at any magnification or reduction.

Year	Country	Cat. No.
1982	Poland	PL 10
1996	Hungary	HU 30

Jack SMITH (1969-)

See *Sabber BATHIA*

Elmer Ambrose SPERRY (1860-1930), was an American inventor, who was best known for his invention of the gyrocompass and automatic pilot for airplanes. His company, the *SPERRY Corporation*, also manufactured *analogue computer* - controlled bombsights before WWII.

SPERRY Co. later merged with *UNIVAC* to become *SPERRY / UNIVAC*, a well-known brand of calculators and computers (*UNIVAC - **UNIV**ersal **A**utomatic **C**omputer*).

Year	Country	Cat. No.
1985	USA	USA 16

William Bradford SHOCKLEY (1910-1989), John BARDEEN (1908-1991), and ***Walter Houser BRATTAIN (1902-1987)***, was American physicists at BELL Labs who invented the *transistor*. They shared the 1956 Nobel Prize in Physics for their invention.

Year	Country	Cat. No.
1977	Comoro Is.	COM 06
1991	St Vincent	STV 03
1993	Madagascar (Malagasy Republic)	MDG 08
1995	Gabon	GA 10
1998	Antigua & Barbuda	ANT 03
1998	Marshall Islands	MAR 04
2000	Central African Republic	CEA 29
2000	Saint Vincent	STV 14
2002	Guinea, Republic	GUR 09
2003	Congo Democratic Republic	CDR 03
2008	USA	USA 64

Pope SYLVESTER II (943-1003), originally named Gerbert, was a well-known educator and archbishop before becoming the first French pope (999-1003). By revising the abacus, he was able to perform arithmetic operations quickly. He also developed a highly complex *abacus*.

Year	Country	Cat. No.
1938	Hungary	HU 01-02
1964	France	FR 09
1982	Hungary	HU 20

Kenneth L. THOMPSON (1943-) was born in New Orleans, Louisiana, USA, and graduated from the University of California at Berkeley in 1966; he then joined *AT&T Bell Laboratories* computing research department. In 1969 he and Dennis RITCHIE (1941-) developed *UNIX*, a multi-user multitasking *operating system* for use on minicomputers that was easily portable across different type of computers.

Year	Country	Cat. No.
1999	Palau	PAL 08

William THOMSON, 1st Baron KELVIN (1824-1907), mathematical physicist and engineer, build *Kelvin's tide predicator (1876)* - an *analogue computer*. Now is displayed at Science Museum in London.

Year	Country	Cat. No.
2007	Serbia	SRB 00

Leonardo TORRES Y QUEVEDO (1852-1936), Spanish developer, developed the first real chess machine (1890) which played the king-with-rook vs. king endgame, and invented a calculating machine - *electromechanical arithometer* (June 26, 1920 - Society for the Encouragement of Science, Paris) that was program controlled. The machine performed the four arithmetic operations and was wired to a typewriter which was used as its input / output device.

Year	Country	Cat. No.
1955	Spain	ESP 01
1983	Spain	ESP 08
2010	Spain	ESP 20

Pafnuty Lvovich TSCHEBYSCHEV (1821-1894), Russian scientist, was professor of mathematics at the University of St. Petersburg for 35 years. He designed and built several devices, including an *analog calculating machine*.

Year	Country	Cat. No.
1946	Soviet Union	USSR 01

Alain M. TURING (1912-1954), English mathematician, developed theory of digital computing and published *On Computable Numbers* (1937). Alain M. Turing and F. C. Williams developed a *code-breaking computer on COLOSSUS* (1943), Bletchley Park (the secret Government Code and Cipher School). This computer could different tasks, like *code breaking* (Enigma), chess, file handling and algebra. Details of COLOSSUS are still sketchy, as they remained state secret for decades.

Year	Country	Cat. No.
1999	Great Britain	GB 14
2000	Portugal	POR 17
2000	Saint Vincent	STV 14
2004	India	IN 13
2005	St Helena	STH 03
2005	Saint Vincent	STV 19
2008	Guinea, Republic	GUR 12
2012	Great Britain	GB 26
2015	Great Britain	GB 30

Leonardo da VINCI (1452-1519). In early 1967, some 700 pages of Da Vinci's notebooks were found in the Spanish National Library. They had been missing for 200 years. Including were drawings of complex gears, hydraulic machines, and other devices. Da Vinci's relationship to computers comes from one of these drawings that appear to show a geared *mechanism for rudimentary adding machine*.

Year	Country	Cat. No.
1932	Italy	IT 01-02
1932	Italy, Aegean Is.	ITA 01-02
1932	Italian Colonies	ITC 01-02
1932	Latvia	LV 01
1935	Italy	IT 04
1938	Italy	IT 05
1948	Liechtenstein	LIE 01
1952	France	FR 06
1952	Germany, DDR	DDR 02
1952	Hungary	HU 04
1952	Italy	IT 09
1952	Italy, Trieste Zone A	ITTA 01
1952	Poland	PL 01
1952	Romania	RO 02
1966	Ecuador	EQ 04
1966	Paraguay	PAR 10-11
1969	Albania	ALB 01
1969	Monaco	MON 02
1970	Niger	NIG 02
1970	Niger	NIG 05
1972	Dubai	DUB 01
1972	Togo	TOG 01
1977	Mali	MA 07
1978	Zaire	ZAI 01
1983	San Marino	SAN 03
1985	Zaire	ZAI 05-06
1989	Madagascar (Malagasy Republic)	MDG 06
1992	Cambodia	CA03
1996	Cuba	CUB 13
1997	Italy	IT 27
2002	Macedonia, North of ~	MK 05
2002	Romania	RO 28
2002	Bosnia & Herzegovina Croat Admin.	BHC 03
2002	Monaco	MON 14
2007	Bosnia & Herzegovina Serb Admin.	BHS 03

John Edward WARNOCK (1940-) is an American computer scientist best known as the co-founder with Charles GESCHKE of *Adobe System Inc.*, the graphics and publishing software company.

Warnock has pioneered the development of graphics, publishing, Web and electronic document technologies that have revolutionized the field of publishing and visual communications.

Year	Country	Cat. No.
1999	Palau	PAL 08

Thomas J. WATSON Sr. (February 17, 1874 - June 19, 1956) was IBM Chief Executive Officer (1914-1956) and served as head of International Chamber of Commerce. He suggested the *WORD PEACE THROUGH WORLD TRADE* slogan.

---------- Catalog by categories P

Watson developed IBM's effective management style and turned it into one of the most effective selling organizations yet seen, based largely around punched card tabulating machines.

Year	Country	Cat. No.
1959	USA	USA 04
2000	Micronesia	MIC 04

Thomas John WATSON Jr. (Jan. 14, 1914 - Dec. 31, 1993) was IBM chairman (1956-1971). By then, IBM had become the undisputed world leaders in computers. In the early 1960s, IBM announced its third generation of computers, the IBM S/360, which was extremely successful and made IBM even more dominant. Thomas J. WATSON was listed as one of TIME Magazine's 100 most influential people of the 20th century.

Year	Country	Cat. No.
1999	Palau	PAL 08

Norbert WIENER (1894-1964), USA, is the creator of *cybernetics* as science. Fundamental work: *Cybernetics or control and communication to the man and machine* (1948), in which he introduced the word *cybernetics* and laid the foundation for the study of the control of processes by automated machines i.e. computers.

Norbert WIENER and Stefan ODOBLEJA are considered to the *pioneers of cybernetics*.

Year	Country	Cat. No.
1999	Israel	IL 22
2000	Moldova	MD 03

Stephen Gary "Woz": WOZNIAK (1950-) is American computer engineer who founded *Apple Computer Inc.* with Steve JOBS and Ronald WAYNE. His inventions and machines are credited with contributing significantly to the *personal computer* revolution of the 1970's.

Wozniak created *APPLE I* and *APPLE II* computers in the mid-1970.

Year	Country	Cat. No.
1999	Palau	PAL 08
2011	Guinea, Republic	GUR 14
2011	Mali	MA 15

2011	Mozambique	MOZ 13-14
2018	Mozambique	MOZ 15

Jerry YANG (1968-) and David FILO (1966-) started surfing the net and created an organized directory to assist their Stanford University friends in locating cool web sites. They named the site *Yahoo!* and as it became more popular, they founded their own company with the same name in 1995.

Year	Country	Cat. No.
1999	Palau	PAL 08

Konrad ZUSE (1910-1995), Germany, is the *inventor of the modern computer* for his series of automatic calculators, which he invented to help him with his lengthily engineering calculations. In 1936, Zuse made a mechanical calculator called the Z1, the first binary computer.

In 1939, Zuse completed the Z2, the first fully functioning electro-mechanical computer.

K. Zuse completed the Z3 in 1941 and created the world's first electronic, fully programmable digital computer based on a binary floating-point number and switching system. Zuse used old movie film to store his programs and data for Z3, instead of using paper tape or punched cards.

He completed and installed the Z4 computer in the Applied Mathematics Division of Zurich's Federal Polytechnic Institute, in use there until 1955. With Z3 and Z4 computers he demonstrates how tooled a program.

Year	Country	Cat. No.
2009	Guinea Bissau	GUS 13
2010	Germany	D 28

For more information concerning other personalities see Lary Dodson - Computers on stamps and stationery, ATA #134 and #152; Wobbe Vegter - Cyber Philately site.

---------- Pixel

The ***pixel*** is a basic unit of programmable color on a *video display terminal (VDT)*. Think of it as a logical - rather than a physical - unit. The physical size of a pixel depends on how you've set the resolution for the display screen.

Screen image sharpness is sometimes expressed as *dpi* (dots per inch) - in this usage, the term *dot* means *pixel*, not dot as *dot pitch*.

---------- Catalog by categories P

Year	Country	Cat. No.
1977	Brazil	BZ 05
1979	Benin	BEN 02
1979	Mali	MA 08
1980	Chad	CHD 07
1980	Ivory Coast	IVC 02
1980	Togo	TOG 02
1982	Poland	PL 09-12
1983	Australia	AU 07
1984	Australia	AU 08
1984	Brazil	BZ 11
1985	Bulgaria	BUL 12
1986	Bulgaria	BUL 14
1986	Cambodia	CA 02
1986	Colombia	COL 04
1986	Comoro Is.	COM 14
1986	Ivory Coast	IVC 03
1988	Belgium	BL 13
1988	Germany, Berlin	BER 06
1988	Germany, FRG	FRG 13
1988	Tunisia	TUN 11
1989	Israel	IL 11
1990	South Africa - Venda	RSAV 02
1990	Thailand	THI 09
1990	Turkey	TU 09-10
1990	Turkey	TU 12-13
1991	Bulgaria	BUL 19
1991	Japan	J 11
1991	Monaco	MON 11
1992	Finland	FIN 13
1994	Great Britain	GB 09-12
1995	Germany	D 07
1996	Turkey	TU 17
1996	Turkey	TU 19
1997	Argentina	AR 07
1998	Germany	D 11
1998	Slovenia	SLO 04
1999	Netherland	NL 40
1999	Slovenia	SLO 08
2000	Great Britain	GB 18
2000	Israel	IL 25
2000	Slovenia	SLO 10
2001	Liechtenstein	LIE 07
2001	Netherland	NL 45
2002	Germany	D 21
2003	Mexico	MEX 35
2006	Japan	J20
2009	Luxemburg	LUX 12
2010	Great Britain	GB 24

---------- Point of sale

Point Of Sale (POS) or checkout is the location where a transaction occurs. A *checkout* refers to a POS terminal or more generally to the hardware and software used for checkouts, the equivalent of an *electronic cash register*. A *POS terminal* manages the selling process by a salesperson accessible interface. The same system allows the creation and putting of the voucher.

Year	Country	Cat. No.
1996	China, Republic of	ROC 26

---------- Printed circuit

Printed circuit (1950) is a card of laminate or resinous material of an isolating type on which an electrical circuit is mounted with elements such as resistors, capacitors, diodes and transistors. Printed circuit, from the late 1960's and into 1970's, when this was the leading computer technology.

Year	Country	Cat. No.
1971	Lebanon	LEB 01
1972	Australia	AU 03
1973	Tunisia	TUN 03
1973	USA	USA 07
1976	Madagascar (Malagasy Republic)	MDG 01
1977	Cape Verde	CAP 01
1977	Gabon	GA 03
1977	Central African Republic	CEA 03
1977	Libya	LIB 01
1977	Iran	IRA 03
1977	Kuwait	KUW 01
1977	Maldives Is.	MLV 04
1977	Mali	MA 06
1977	Peru	PER 02
1977	Senegal	SEN 01
1977	Tunisia	TUN 04
1978	Viet Nam	VIT 02
1979	China, Hong Kong	HK 01
1979	Czechoslovakia	CZ 09
1979	Laos	LAO 02
1979	Israel	IL 06
1979	Mexico	MEX 09
1979	Singapore	SIN 06
1979	South Africa, Bophuthatswana	RSAB 01
1981	Netherland	NL 13
1982	Gibraltar	GIB 01
1982	Italy	IT 16
1982	Korea, South	SK 05

---------- Catalog by categories P

1982	Laos	LAO 03
1984	Mexico	MEX 11
1985	Laos	LAO 09
1986	Bulgaria	BUL 13
1986	Iceland	IC 02
1987	Canada	CAN 15
1988	Denmark	DK 05
1988	Switzerland	CH 10
1989	Israel	IL 09
1989	Mexico	MEX 15
1989	Switzerland	CH 13
1991	Portugal	POR 11
1992	Moldova	MD 01
1993	China, Hong Kong	HK 06
1993	China, Republic of	ROC 23
1994	Germany	D 06
1997	China, Republic of	ROC 31
1997	Singapore	SIN 22
1998	Liechtenstein	LIE 06
1999	Dominican Republic	DOR 05 sheet
1999	India	IN 08
2000	Andorra, French Admin.	AN 02
2000	Bulgaria	BUL 21
2000	Iceland	IC 06
2000	Malaysia	MLY 19
2000	Malaysia	MLY 21
2000	Philippines	PH 10
2000	Portugal	POR 15
2000	Portugal	POR 18
2001	Bulgaria	BUL 23
2001	Malaysia	MLY 23
2001	Pitcairn Is.	PIT 05-08
2002	Cuba	CUB 15
2002	Jordan	JOR 05
2002	Maldives Is.	MLV 11
2003	Israel	IL 31
2003	Thailand	THI 33
2004	Thailand	THI 35
2005	Croatia	HR 09
2005	France	FR 37
2005	Israel	IL 35
2005	Moldova	MD 08
2006	Jordan	JOR 06-10
2006	Senegal	SEN 13
2007	Cuba	CUB 21
2007	Italy	IT 36
2008	Libya	LIB 16
2010	Cuba	CUB 28
2010	Malaysia	MLY 31
2012	Portugal	POR 36
2016	Slovenia	SLO 20
2017	Mongolia	MOG 18
2018	USA	USA 77
2019	Israel	IL 50
2020	USA	USA 78

---------- Quipu

Quipu (from the Peruvian Inca language *Quechuc*, meaning *knot*) was used by the Incas in Peru and was based on the decimal system.It consisted of a stick or cord to which knotted-strings of various colors were attached. The number of knots and their position on the cords represent the numerical values. It was used extensively for accounting purposes, like calculating crop sizes, etc.

Year	Country	Cat. No.
1934	Mexico	MEX 01
1944	Paraguay	PAR 01
1944	Paraguay	PAR 02
1946	Paraguay	PAR 05
1946	Paraguay	PAR 06
1968	Paraguay	PAR 12
1972	Paraguay	PAR 13
1972	Peru	PER 01
1974	Rwanda	RW 02
2000	Nevis	NEV 01

Quipu.
Registered no. 73908, censored letter from Paraguay to USA, first day issue - see PAR 01(author's collection).

---------- Robotics

The ***robot*** - the word has been introduced by the Czech Karel CAPEK (1890-1930), in 1921 - means an automatic apparatus based on a program with a complex connections able to execute a series of conducted actions.

The *robotics* is quickly, mainly in USA, Japan and Sweden, including nowadays - *industrial computer*.

Year	Country	Cat. No.
1958	Czechoslovakia	CZ 01
1966	Germany, DDR	DDR 11
1968	Czechoslovakia	CZ 06
1970	Niger	NIG 05
1970	Soviet Union	USSR 17
1970	Uruguay	UR 01
1971	Bhutan	BHU 01
1971	Germany, DDR	DDR 15
1971	Hungary	HU 07
1971	Mongolia	MOG 02
1971	Poland	PL 03
1971	Romania	RO 10
1971	Soviet Union	USSR 19
1972	Chad	CHD 03
1972	Cuba	CUB 05
1972	Germany, DDR	DDR 18
1972	Soviet Union	USSR 21
1973	Germany, DDR	DDR 19
1973	Mongolia	MOG 03
1973	Soviet Union	USSR 22-23
1975	Cuba	CUB 07
1976	Central African Republic	CEA 01
1976	Chad	CHD 04
1976	Comoro Is.	COM 03-04
1976	Dominica	DOM 02
1976	Hungary	HU 11-12
1976	Korea, Democratic People's Republic	DPRK 03
1976	Madagascar (Malagasy Republic)	MDG 02
1976	Maldives Is.	MLV 02-03
1976	Mali	MA 04-05
1976	Paraguay	PAR 14
1976	Uruguay	UR 02
1976	Volta, Upper	UV 02
1976	Yemen, People's Democratic Republic of	YPDR 01
1977	Benin	BEN 01
1977	Central African Republic	CEA 02
1977	Gabon	GA 04
1977	Guinea Bissau	GUS 01-02
1977	Hungary	HU 13
1977	Mauritania	MAU 03-04
1977	Niger	NIG 07-08
1977	Paraguay	PAR 16
1977	Senegal	SEN 02
1979	Central African Republic	CEA 05
1979	Chad	CHD 06
1979	Mauritania	MAU 06-07
1979	Mauritania	MAU 09-10

1979	Mongolia	MOG 04-05
1979	Niger	NIG 09-10
1980	Central African Republic	CEA 06
1981	Djibouti	DJ 02
1981	Guinea Bissau	GUS 06
1981	Soviet Union	USSR 39
1981	Thailand	THI 04
1982	Benin	BEN 06
1982	Cuba	CUB 09
1982	Czechoslovakia	CZ 13
1982	Djibouti	DJ 03
1983	Chad	CHD 08
1983	Italy	IT 17
1984	Central African Republic	CEA 15
1984	Korea, Democratic People's Republic	DPRK 12
1984	Laos	LAO 07
1984	Maldives Is.	MLV 06
1984	Sweden	SWE 05
1985	Central African Republic	CEA 17
1986	Anguilla	ANU 01
1986	Canada	CAN 10
1986	Singapore	SIN 14
1992	Comoro Is.	COM 17
1992	Iran	IRA 07
1992	Netherland Antilles	NEA 11
1993	China, Republic of	ROC 23
1993	Congo, People's Republic	CPR 05-06
1993	Guinea, Republic	GUR 03
1994	Central African Republic	CEA 22
1994	Guyana	GUY 09-10
1994	Mali	MA 12
1994	Nicaragua	NIC 09
1995	Burkina Faso	BF 02
1995	Burkina Faso	BF 03
1995	Germany	D 09
1995	Mexico	MEX 20
1996	Guyana	GUY 11
1996	Palau	PAL 01
1996	Sierra Leone	SIL 08
1996	Turks & Caicos Is	TUC 05
1997	Italy	IT 28
1987	Australia	AU 13
1987	Belgium	BL 11
1987	Germany, DDR	DDR 35
1987	Madagascar (Malagasy Republic)	MDG 04
1987	Monaco	MON 06
1988	Soviet Union	USSR 58
1989	Great Britain	GB 05
1989	Madagascar (Malagasy Republic)	MDG 05
1989	Sierra Leone	SIL 01
1989	Soviet Union	USSR 60

---------- Catalog by categories R

1989	Soviet Union	USSR 61
1990	Czechoslovakia	CZ 18
1990	Sierra Leone	SIL 04
1991	Congo, People's Republic of	CPR 02
1991	Grenada	GRE 10
1991	Netherland	NL 23
1997	Niger	NIG 15
1997	Togo	TOG 08
1997	Turks & Caicos Is	TUC 06
1997	Uganda	UG 06
1997	USA	USA 35-36
1997	Uruguay	UR 10
1998	Palau	PAL 04-05
1999	Canada	CAN 38
1999	Gabon	GA 11
1999	Great Britain	GB 15
1999	Grenada Grenadines	GREG 03
1999	Italy	IT 31
1999	Korea, Democratic People's Republic	DPRK 16
1999	Madagascar (Malagasy Republic)	MDG 14
1999	Micronesia	MIC 02-03
1999	Palau	PAL 06-07
1999	United Nations (NY)	UNNY 07
2000	Australia	AU 31-32
2000	Burkina Faso	BF 04
2000	Canada	CAN 44
2000	Central African Republic	CEA 30
2000	Central African Republic	CEA 32
2000	Gibraltar	GIB 05
2000	Greece	GR 05
2000	Israel	IL 27
2000	Nevis	NEV 02
2000	Nevis	NEV 04
2000	Palau	PAL 09
2000	Palau	PAL 12
2000	United Nations (NY)	UNNY 09
2001	Andorra, French	AN 03
2001	Australia	AU 33
2001	Niger	NIG 17
2002	Antigua & Barbuda	ANT 07
2002	Australia	AU 35
2002	Belgium	BL 19
2002	Singapore	SIN 31
2003	Antigua & Barbuda	ANT 08
2003	Japan	J 19
2004	Grenada	GRE 19
2006	Korea, South	SK 30
2006	Palau	PAL 15
2006	Saint Vincent	STV 20
2007	Guinea, Republic	GUR 09b
2007	Saint Thomas and Prince Is.	STT 02
2008	Finland	FIN 23

2008	Palestinian Authority	PNA 01
2010	Czech Republic	CZR 07
2013	Luxemburg	LUX 17
2016	Sierra Leone	SIL 14a
2017	China, People's Republic of	PRC 28A
2018	Israel	IL 49
2019	Israel	IL 50
2020	Serbia	SRB 09
2020	USA	USA 79

---------- Scanner

A ***scanner*** converts the information into formats that can be used by the computer.

Year	Country	Cat. No.
1984	Germany, FRG	FRG 10
1987	China, Hong Kong	HK 02
1987	Indonesia	IND 05
1992	Macedonia, North of ~	MK 01
1993	Macedonia, North of ~	MK 02
1995	Malaysia	MLY 07
2000	Grenada Grenadines	GREG 04
2011	Mexico	MEX 38
2012	Mauritius	MAS 11

---------- Scientific events

The computer industry, like other branches of industry, holds many scientific conventions in order to develop ideas and share knowledge and technology among scientists from various countries.

Year	Country	Cat. No.
1960	Soviet Union	USSR 03
1971	Poland	PL 02
1980	Japan	J 05
1992	Iran	IRA 06
1994	Chile	CHI 01
1998	Hungary	HU 32

---------- Smart stamps

The ***smart stamps*** launch on your smartphone (iPhone or Android) an exclusive video.

Year	Country	Cat. No.
2011	Great Britain	GB 25

---------- Software

Software is a general term for various *programs* used to operate computer and related devices. Software includes all programs (set of instructions) that operate the computer by *instructing* it what to count, how to calculate.

---------- Catalog by categories S

The word *algorithm* is derived from the name of Mohamed ben Muja ALKARISMI. *Software algorithms* define the procedure a *program* takes to solve a problem.

A *program* is composed of specific commands that tell the computer what to do. The document listing these commands in the order in which they are to be executed is called a *program listing*.

Software is often divided into *system software* (which includes *operating system* and programs that support application software) and *application software* (programs that to work users are directly interested in).

Operating system (OS) for PC's - after being initially loaded into the computer by a boot program, manages all the applications programs in a computer.

*DOS - **D**irty **O**perating **S**ystem* was the first widely-installed *OS* in microcomputer, was developed, in 1976, by Bill GATES and his new MICROSOFT Company. *WINDOWS - MICROSOFT Operating System for PC's*, was released in November 1985, and is designed for personal or small-office professional or business use. *OS/2 - **O**perating **S**ystem for IBM's PC line* of second - generation, was announced in April 1987 and released in December 1987. *OS/2* is a sophisticated multitasking system competing with *MICROSOFT's WINDOWS* in terms of capability and performance.

A *programming language* is an artificial language designed to express computations that can be performed by a machine, particularly a computer. *Programming languages* can be used to create programs that control the behaviour of a machine, to express *algorithms* precisely, or as a mode of human communication. Many *programming languages* have some form of written specification of their syntax (form) and semantics (meaning).

The earliest *programming languages* predate the invention of the computer, and were used to direct the behaviour of machines such as *JACQUARD loom* and player pianos. Thousand of different *programming languages* have been created, mainly in the computer field, with many more being created every year. Most *programming languages* describe computation in an imperative style, i.e., as a sequence of commands, although some

languages, such as those that support functional programming or logic programming, use alternative forms of description.

Instant Messaging Software is *application software* that allows Internet users to conduct computerized correspondence, with the recipient instantly receiving the sent message. Various messaging systems have been developed since 1970's, but their capabilities were very limited.

In 1996, Israeli software developers Yair Goldfinger, Arik Vardi, Sefi Vigiser and Amnon Amir introduced an innovative system called *ICQ*, with the assistance of entrepreneur Yossi Vardi. For the first time, installation of this system allowed every Internet user to know which of his / her friends was available to chat at any given moment and to communicate with them via *instant messaging*.

Year	Country	Cat. No.
1983	Poland	PL 13
1983	St Lucia	STL 02
1983	Soviet Union	USSR 44
1990	Uruguay	UR 06
1991	Bolivia	BOL 02
1993	Mauritius	MAS 04
1994	Chile	CHI 01
1997	Israel	IL 21
1999	Canada	CAN 34
1999	Great Britain	GB 13
1999	Mexico	MEX 21
2000	Denmark	DK 10
2000	Israel	IL 24
2001	Netherland	NL 45
2002	Brazil	BZ 40
2002	Palau	PAL 13
2003	New Zealand	NWZ 11
2003	Singapore	SIN 35
2003	South Africa	RSA 08
2004	India	IN 13
2004	Singapore	SIN 41
2005	Brazil	BZ 42
2007	Cuba	CUB 24A
2007	Japan	J 23
2008	China, People's Republic of	PRC 24
2008	Guinea, Republic	GUR 12
2008	Guinea, Equatorial	GEQ 03
2008	Saint Thomas and Prince Is.	STT 03
2009	Guinea Bissau	GUS 14-15
2009	Israel	IL 40
2013	Romania	RO 41
2017	Cuba	CUB 34
2019	Bangladesh	BAN 14
2019	Moldova	MD 14
2020	Tuvalu	TUV 05

---------- Catalog by categories S

---------- SOHA

SOHA - ***S****mall* ***O****ffices and* ***H****ome* ***A****pplications*. The home computer has become a popular hobby in and of itself, as well as a tool for other hobbies such radio amateurs, philately, etc. Science and technology at man's service - at his home.

Year	Country	Cat. No.
1992	United Nations (NY)	UNNY 05
1997	Uruguay	UR 11
2000	Singapore	SIN 28
2001	French Southern & Antarctic Lands Territory	TAAF 07
2002	Ghana	GH 09
2002	Ghana	GH 11

---------- Sorting solutions

Computer plays an important role in various phases of the automated mail **sorting** process. In order for mail to be delivered, it must be sorted according to its destination. The activity of *mail sorting*, including the technologies which contribute to this, is showing in author paper concerning postal service.

Few *sorting solutions*:

- Automatic sorting by character recognition:
  - MICR - Magnetic Ink Character Recognition;
  - OCR - Optical Character Recognition;
  - Mark sensing
- Barcode;
- Luminescent mark reading;
- Reading matrix code;
- Conversion of voice into digital data recognized by the computer.

In this way automated equipment determines the location of postage stamps on the envelopes, and, based on this information, causes all the envelopes to be faced in the same direction and canalled.

Year	Country	Cat. No.
1962	China, Republic of	ROC 02
1963	Germany, DDR	DDR 06
1965	Soviet Union	USSR 12
1969	Great Britain	GB 02
1971	Argentina	AR 02
1971	Egypt	EGY 02
1972	China, Republic of	ROC 03
1973	USA	USA 06

1974	France	FR 14
1974	France - Reunion	FRR 01
1974	Qatar	QA 05
1974	Romania	RO 13
1975	South Africa	RSA 01
1976	Italy	IT 13
1976	China, Republic of	ROC 05
1976	Spain	ESP 04
1977	Korea, Democratic People's Republic	DPRK 04
1977	Soviet Union	USSR 29-30
1977	Uruguay	UR 03
1978	Hungary	HU 15
1978	Portugal	POR 06
1979	Brazil	BZ 07
1979	Kuwait	KUW 02
1979	Romania	RO 17
1980	Barbados	BAR 02
1980	Morocco	MOR 02
1982	Italy	IT 16
1982	Saudi Arabia	SAA 01
1983	Cuba	CUB 10
1983	Hungary	HU 22
1983	Portugal	POR 09
1983	Salvador	SAL 02
1983	Seychelles	SEY 02
1984	Czechoslovakia	CZ 14
1984	Germany FRG	FRG 10
1984	Malaysia	MLY 04
1984	Oman, Sultanate of	OM 01
1985	Hungary	HU 26
1986	Bangladesh	BAN 02
1986	China, Republic of	ROC 13
1986	Sweden	SWE 07
1986	Switzerland	CH 08-09
1988	Bangladesh	BAN 03
1988	Luxemburg	LUX 02
1989	Cuba	CUB 12
1990	Korea, South	SK 12
1991	France	FR 25
1991	Tunisia	TUN 14
1992	Indonesia	IND 08
1996	China, Republic of	ROC 28
1996	Slovenia	SLO 02
1997	Thailand	THI 19
1999	Russian Federation	RU 03
1999	Slovakia	SLV 03
1999	Thailand	THI 28
2000	Croatia	HR 03
2000	Portugal	POR 21
2003	Slovenia	SLO 14
2008	New Caledonia	NWC 12
2009	Liechtenstein	LIE 09
2009	Slovenia	SLO 16
2013	Brazil	BZ 45

2015	Turkey	TU 23
2016	China, People's Republic	PRC 27A

---------- Transistor

W. SHOCKLEY, J. BARDEEN and W. BRATTAIN invented ***transistor*** in 1947, the fundamental component of 2nd generation computers. The *transistor* could perform many of the functions of the vacuum tube, using less power and occupying only 1/100 of its volume.

The *transistor* paved the way for all modern electronics, from computers to microchips.

Year	Country	Cat. No.
1910	Panama	PAN 00
1964	Germany, DDR	DDR 08
1965	Soviet Union	USSR 11
1969	Great Britain	GB 01
1971	Nicaragua	NIC 03
1973	USA	USA 07
1977	Comoro Is.	COM 06
1981	Singapore	SIN 07
1981	Soviet Union	USSR 36
1986	Sri Lanka	SRL 01
1987	Sri Lanka	SRL 02
1990	Tanzania	TAN 02
1991	St Vincent	STV 03
1993	Madagascar (Malagasy Republic)	MDG 08
1995	Gabon	GA 10
1998	Antigua & Barbuda	ANT 03
1998	Marshall Islands	MAR 04
1999	Dominica	DOM 06
2000	Central African Republic	CEA 29
2000	Saint Vincent	STV 15
2002	Guinea, Republic	GUR 09
2003	Congo Democratic Republic	CDR 03
2008	USA	USA 64

---------- Typewriter

The ***typewriter*** was invented by Peter MITTERHOFER (1822-1893) in 1864 and put into production in the mid - 1880s. The first models were chiefly for the blind and produced embossed writing. Usage was punched and was meant for blind people.

The keyboard and application stood the model for the computer keyboards of today.

Year	Country	Cat. No.
1895	Uganda	UG 00-00a
1896	Uganda	UG 00b

1928	Uruguay	UR 00
1993	Salvador	SAL 03
1995	Spain	ESP 10A
2000	Croatia	HR 02
2002	Malaysia	MLY 25
2004	Bolivia	BOL 05
2003	Serbia Montenegro	SMN 01
2008	Italy	IT 37
2009	Italy	IT 39
2011	USA	USA 72
2012	China, Hong Kong	HK 29
2014	Spain	ESP 25
2015	Turkey	TU 21
2020	Italy	IT 45

------ Uniform Resource Locator (URL)

URL - ***U****niform* ***R****esource* ***L****ocator* is a compact string of characters used to represent a resource available on the Internet. In popular usage and many technical documents, it is a synonym for *URI* - ***U****niform* ***R****esource* ***I****dentifier*.

Every *URL* begins with the *scheme name* that defines its name space, purpose, and the syntax of the remaining part of the *URL*. Most Web-enabled programs will try to deference a *URL* according to the semantics of its scheme and a context. It is current strict technical meaning; a *URL* is a *URI* that, in addition to identifying a resource, a means of locating the resource by describing its primary access mechanism.

On the Internet, a hostname is a domain name assigned to a host computer. This is usually a combination of the host's local name with its parent domain's name.

Year	Country	Cat. No.
1997	Great Britain - Guernsey	GBG 05
1997	Netherland	NL 34
1997	Philippines	PH 07
1997	Thailand	THI 23
1997	Uruguay	UR 11
1998	Aland	AL 01-02
1998	Germany	D 14
1998	New Zealand	NWZ 05-06
1998	Switzerland	CH 19
1999	Great Britain, Guernsey	GBG 07
1999	Mexico	MEX 21
1999	Switzerland	CH 20
1999	USA	USA 39
2000	Aland	AL 03
2000	Algeria	ALG 06
2000	Bangladesh	BAN 09
2000	Brazil	BZ 35

2000	Ireland - Eire	IRL 11
2000	Marshall Islands	MAR 11
2000	New Zealand	NWZ 08
2000	Palau	PAL 11
2000	Sweden	SWE 10
2000	USA	USA 50
2000-1	USA	USA 51
2001	Antigua & Barbuda	ANT 05
2001	Austria	OS 09-10
2001	Belgium	BL 14
2001	Belgium	BL 17
2001	Dominica	DOM 08
2001	France	FR 32 sheet
2001	Japan	J 15
2001	Denmark	DK 11-13
2001	Grenada	GRE 15
2001	Korea, South	SK 20
2001	Marshall Islands	MAR 12
2001	New Caledonia	NWC 07
2001	Pitcairn Is.	PIT 05-08
2001	Poland	PL 18
2001	Sierra Leone	SIL 12
2001	Tuvalu	TUV 03
2001	Uganda	UG 09
2001	Viet Nam	VIT 12
2002	Antigua & Barbuda	ANT 06
2002	Austria	OS 11-13
2002-4	Austria	OS 14
2002	China, Hong Kong	HK 19
2002	Jordan	JOR 04
2002	Korea, South	SK 24
2002	New Caledonia	NWC 08
2002	New Zealand	NWZ 10
2002	Norfolk Island	NRF 02
2002	Singapore	SIN 33
2002	USA	USA 54
2002-3	USA	USA 53
2003	Austria	OS 15-23
2003	Austria	OS 17a
2003	Faeroe Islands	FAR 03
2003	Hungary	HU 37
2003	Iran	IRA 13
2003	Japan	J 17-18
2003	Micronesia	MIC 05
2003	New Caledonia	NWC 09
2003	Poland	PL 21
2003	Slovenia	SLO 14
2004	Austria	OS 23
2004	Azerbaijan	AZ 03
2004	Belarus	BEL 01
2004	Faeroe Islands	FAR04-05
2004	France	FR 36
2004	French Polynesia	FRP 04
2004	Great Britain	GB 19

---------- Catalog by categories U

2004	Japan	J 20-21
2004	Qatar	QA 08
2004	Singapore	SIN 39
2004	Tuvalu	TUV 04
2005	Austria	OS 24
2005	Belgium	BL 20
2005	Bosnia & Herzegovina	BH 04
2005	China, Hong Kong	HK 26
2005	Cuba	CUB 25
2005	Cyprus, Turkish Republic of Northern	CYT 05
2005	Hungary	HU 43
2005	Malta	MAT 07
2005	Portugal	POR 31
2005	USA	USA 56
2005-6	Austria	OS 26
2005-6	USA	USA 58
2006	Austria	OS 27-28
2006	Faeroe Islands	FAR 06
2006-19	France	FR 38-50
2006	Great Britain - Guernsey	GBG 08
2006-9	Monaco	MON 15-16
2006-16	Morocco	MOR 08-12
2006-8	New Caledonia	NWC 10-16
2006	Singapore	SIN 43
2006	Spain	ESP 16
2006	Spain	ESP 18
2006	Ukraine	UK 05
2007	Austria	OS 29
2007	Egypt	EGY 18
2007	Faeroe Islands	FAR 07
2007	France	FR 39A
2007	Great Britain	GB 22
2007	Singapore	SIN 48
2007	USA	USA 62
2008	Austria	OS 30
2008	Austria	OS 32
2008	Austria	OS 33-34
2008	Belarus	BEL 04
2008	Czech Republic	CZR 04
2008	Egypt	EGY 19
2008	New Caledonia	NWC 11
2008	Portugal	POR 32
2008	Ukraine	UK 06
2009	Australia	AUS 35 booklet
2009	Czech Republic	CZR 05
2009	Guinea Bissau	GUS 14
2009	Jordan	JOR 12
2009	Luxemburg	LUX 10
2009	Luxemburg	LUX 13
2009	Moldova	MD 11
2009	Switzerlamd	CH 28
2009	USA	USA 68
2010	Netherland	NL 63
2010	Portugal	POR 35

---------- Catalog by categories U-V

2010	USA	USA 69
2011	Cook Is.	COK 01-02
2011	Croatia	HR 11
2011	Ecuador	EQ 13
2011	Kazahstan	KAZ 04
2011	Luxemburg	LUX 15
2011	Netherland	NL 64B
2011	Serbia	SRB 02
2011	USA	USA 70-71
2011	USA	USA 74-75
2012	Bolivia	BOL 07
2012	Germany	D 30-31
2012	Germany Private Post - CITI POST	DPP 01
2012	Hungary	HU 46
2012	Netherland	NL 68a
2012	Netherland	NL 70
2012	Poland	PL 25
2012	USA	USA 74
2013	Brazil	BZ 47 block
2013	Luxemburg	LUX 17
2013	Micronesia	MIC 06
2013	Moldova	MD 12
2013	Netherland	NL 71
2013	Netherland	NL 73
2013	Thailand	THI 43
2014	Italy, Private Post - GPS	ITPP 01
2014	Netherland	NL 74
2014	Russian Federation	RU 12-15
2015	Indonesia	IND 25
2015	Serbia	SRB 06
2016	Burkina Faso	BF 05
2016	Italy, Private Post - GPS	ITPP 02
2016	Mauritania	MAU 14
2016	Morocco	MOR 12
2016	Senegal	SEN 15
2017	Algeria	ALG 15
2017	Tunisia	TUN 42
2018	Portugal, Private Post	PORPP 01
2019	Belgium	BL 26
2019	Russian Federation	RU 17
2020	India	IN 26
2020	Kyrgyzstan	KYZ 05

---------- Vacuum tubes

Vacuum tubes by there *on* and *off* states can represent binary values. Electronic computers are programmed to work with 1 and 0, it is the only thing they know by themselves; something is switched *off* and *on*.

Year	Country	Cat. No.
1929	USA	USA 02
1936	Belgium	BL 01
1947	USA	USA 03

1949	Japan	J 01
1956	Japan	J 03
1958	Malta	MAT 01
1966	Yemen Arab Republic	YAR 01
1967	Saint Pierre & Miquelon	STP 01
1967	Spain	ESP 03
1968	Soviet Union	USSR 16
1970	Niger	NIG 03
1973	Australia	AU 05
1973	Germany, Berlin	BER 03
1973	USA	USA 08-09
1974	Rwanda	RW 01
1977	Rwanda	RW 06
1980	Uruguay	UR 04
1981	Wallis & Futuna	WAF 01
1982	San Marino	SAN 01
1983	USA	USA 15
1991	Austria	OS 08
1995	Cape Verde	CAP 02
1995	Czech Republic	CZR 01
1995	Egypt	EGY 03
1995	Finland	FIN 17
1995	Monaco	MON 12
1996	Panama	PAN 02
1997	Romania	RO 21
1997	Vanuatu	VAN 03
1998	Gabon	GH 08
1998	USA	USA 37
2000	Denmark	DK 09
2000	Gabon	GA 13
2001	Uruguay	UR 14

---------- Video-games

See *computer games*

---------- Videotex

Videotex is an early interactive information service, which include the exchange of alphanumeric and graphic information through the use of modified television sets. Are known following services: ***Prestel*** - Post office's view data technology, ***Bildschirmtex, Minitel***.

Prestel is an interactive videotext system developed during the late 1970's and commercially launched in 1979. It was developed under the leadership of Samuel FEDIKA at the then Post Office Research Station (now Adastral Park - though insiders still say "the Labs") in Martlesham, Suffolk, Great Britain.

Bildschirmtex is an early interactive information service using computers and modified TV sets, demonstrated in 1979 at the International Broadcasting Exhibition in Berlin.

Minitel is a videotext online service accessible through the telephone lines, and is considered one of the world's most successful *pre-World Wide Web* online services. It was launched in France in 1982 by the *PTT - **P**oste, **T**éléphone et **T**élécommunications*.

Year	Country	Cat. No.
1979	Germany, Berlin	BER 04
1982	Great Britain	GB 04
2013	Singapore	SIN 51

---------- Virtual reality

Virtual reality is the simulation of a real or imagined environment that can be experienced visually in the three dimensions of width, height, and depth, which may additionally provide an interactive visual experience in full real-time motion, with sound and possibly with tactile and other form of sensory feedback.

The term *virtual realit*y was invented by Jaron LANIER.

Year	Country	Cat. No.
1998	Russian Federation	RU 01
1999	Palau	PAL 08
2000	USA	USA 48
2008	Portugal	POR 33

---------- Word processing

Word and Text handling enable the user to type his document, edit it interactively as well as insert pictures and graphs. Information retrieval involves the locations of documents by keyword or free text search and it is used extensively in archives and libraries. The retrieval of legal precedents is an example.

Computers are used in: archives to facilitate indexing, location, scanning and analyze of documents; in libraries, include now days also multimedia - data, voice and pictures / video concurrently. Most important groups are *word processors*, data base software's.

Year	Country	Cat. No.
1982	Great Britain	GB 03
1983	Italy	IT 19
1984	Germany, FRG	FRG 11
1988	Brazil	BZ 16
1991	China, Republic of	ROC 22
1994	Malaysia	MLY 07
1994	Switzerland	CH 17
1997	Barbados	BAR 05
1998	Netherland	NL 36
2001	Japan	J 16
2004	Tristan de Cunha	TDC 01

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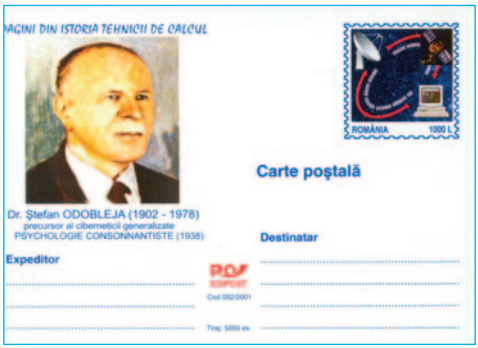
Printing labels. Both labels are printed with 9-needle dot-matrix printer using purple ribbon and pre-printed label paper (December 17, 1991).

Special computerized label issued to the sender of registered letter by India Post with slogan (IC CHIP - CHANGING THE WORLD) at the bottom. Senders can also pay postage through the receipts. One half of this label is posted on the letter and other half is given to the sender. The portion pasted on the letter - doesn't carry slogan, only the other half has slogan. Only one day this slogan were in circulation from only one Post Office in India (author's collection).

A world in a single house - postal stationery EDIPOST code 028/98, major error in the printed stamp: the word **ROMÂNIA** is moved upwards, so the letters **ÂNIA** are partially covered by the image. Only one piece is known (author's collection).

---------- Postal cards with computer topics designed by the author



---------- Postal cards with computer topics designed by the author

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Astrolabe 4
Augmented reality 4
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Biometric authentication 8
Calculating tools 8
Calculator 9
~, temporal 9
Cash register 10
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~ - LED / LCD 10
~ - Other 11
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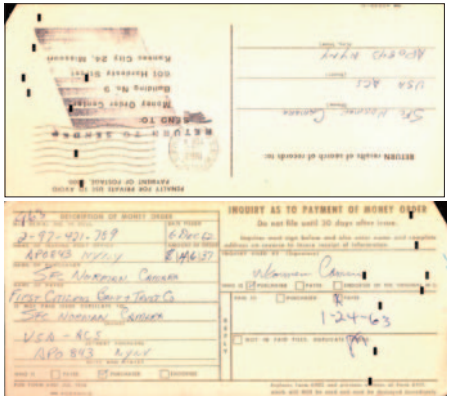
Punched card as mail support. Departure postmark U.S. POSTAL SERVICE P.A.164 AUG 6 1973 (ex.Michel Landrieu collection).

Deposit card - punch card. Deposit card G8c in the size of a common punch card and using the Hollerith - system. Put into production from October 2, 1961. This card was used for depositing money. Notification description was coded (see punch holes) for automatic processing of the data. Right part, proof of deposit, was send to the payer. There are 7 different versions of this payment card, including denominations for three tax increases. The printed values were appering alternating on the left or right part. The payement method was no longer used starting on July 30, 1996 (author's collection).

Trans-Dniester postal stationery dedicated to Apple Computer Inc., issued by Trans-Dniester Post (not recognized by UPU), sent by international registered letter, supplementary with postage stamps issued by Moldova Post (author's collection).



USA - money order used as punched card. Military postmark U.S. ARMY POSTAL SERVICE A.P.O. 1963 843 FEB 6 (author's collection).