

Министерство образования Республики Беларусь

Учреждение образования

БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
ИНФОРМАТИКИ И РАДИОЭЛЕКТРОНИКИ

Кафедра иностранных языков N1

Text book for the first year students of the evening faculty

Сборник текстов по английскому языку для студентов 1-го курса ФВО

Минск 2002

УДК 4И (англ.) (075,8)
ББК 81.432.1 я73
С 23

Составители: П.Г. Елисеева, И.В. Войтова, А.Н.Семенов

Сборник текстов по английскому языку для студентов 1-го курса
С 23 ФВО / Сост. П.Г. Елисеева, И.В. Войтова, А.Н.Семенов –
Мн.: БГУИР, 2002 – 25 с.

Данная разработка предназначена для студентов I курса
вечернего отделения радиотехнического профиля.

Целью разработки является развитие навыков чтения и понимания
научно-технической литературы на материале текстов по
специальностям: радиотехника, вычислительная техника,
проектирование и производство радиоаппаратуры.

Разработка включает 20 текстов, к каждому из которых дан
словарь, содержащий пассивную лексику, предназначенную для
облегчения понимания текстов.

Тексты в сокращенном виде взяты из учебника И.П. Куприна
“Energy is the source of life” «Пособие для средних специальных
технических учебных заведений», Санкт-Петербург «Каро», 2000 и из
аутентичной литературы по радиотехнике и вычислительной технике.

УДК 4И (англ.) (075.8)
ББК 81.432.1 я73

© П.Г.Елисеева, И.В. Войтова,
А.Н. Семенов составление, 2002

© БГУИР, 2002.

Text 1

TRANSISTORS

Among the most important discoveries in electronics during recent years is the transistor: the point-contact transistor and the junction transistor.

The transistor is a very small device, which may be used to amplify currents and perform other functions usually performed by the thermionic valve. The point-contact transistor consists essentially of a small block of germanium or silicon that are semiconductors with two closely spaced metallic point electrodes (termed the emitter and the collector electrodes) on the upper surface, and a plane electrode of large area (the base electrode) on the opposite surface. The emitter is maintained at a positive potential, and the collector at a larger negative potential with respect to the base. The signal to be amplified is introduced into the emitter circuit and the amplified signal in the collector circuit. During operation the transistor becomes heated, that is why it is necessary to make certain that the transistor circuit is not overloaded beyond its operating limits. Its principal advantages are as follows: no current is required for a heater circuit, as the transistor works at room temperature: in its very small size and weight and its comparatively rugged construction.

The junction transistor was also made of a germanium crystal, though this was mostly replaced later by more cheap silicon. The crystal had three electrically different layers in which the current was carried by different charge carriers. The crystal was a kind of sandwich with the two outer, and thicker, layers consisting of a material of ("n") conductivity and the middle, the thin base of ("p") conductivity. The current in the outer layers was carried by electrons, negative charge carriers, and the current in the base was carried by "holes", positive charge carriers. The device came to be called n-p-n (or junction) transistor.

Notes

point-contact transistor — точечный полупроводниковый транзистор

junction transistor — плоскостной транзистор

to amplify — (радио) усиливать; расширять; увеличивать

thermionic — термоэлектронный, ламповый

to space — размещать, помещать

to maintain — поддерживать, сохранять; (тех.) обслуживать

with respect to — что касается; относительно

to make certain — убедиться, удостовериться

to overload — перегружать

rugged — массивный

comparatively — сравнительно, относительно

emitter — излучатель, эмиттер

to introduce — вводить, представлять

to term — называть

Text 2

RADIO COMMUNICATION

Radio communication is the transfer of high-frequency energy from the transmitter to the receiver without wires.

Radio is a device that transmits and receives signals and programs by electromagnetic waves. Since the process of radio communication includes transmission and reception of signals, the necessary components of radio are a transmitter and a receiver.

The transmitter is a device that produces radio-frequency energy. The main parts of transmitter are a high-frequency oscillator including an oscillatory circuit and one or more amplifiers. In modern transmission electron tubes are used to amplify currents and give greater transmitting range and better reception.

The receiver is a device that receives waves sent out by a transmitter. Radio receiver demodulates the waves and they are heard as speech, music and signals.

Electric oscillations are produced in the antenna of the transmitter. They travel in all directions.

Radio waves are electric waves of very high frequency; they travel through space at the speed of light. They differ from other waveforms only in frequency (number of vibrations per second).

Notes

transfer — передача

high-frequency — высокочастотный

to send out — испускать, излучать

oscillator — излучатель, осциллятор

oscillatory — колебательный

amplifier — усилитель

to amplify — усиливать

Text 3

TELEVISION SYSTEM

In a television system two separate transmitters are employed — one for the sound channel and the other for the picture channel. The sound transmitter is frequency-modulated. It simultaneously transmits the sound, which accompanies the image. Each transmitter has its own antenna.

The image being televised is received by the television camera, which converts electrical impulses into optical impulses. These electrical impulses are amplified by the video or picture amplifier. After proper amplification, the video signal modulates the high-frequency carrier of the television transmitter and is radiated into space by the aerial. The picture carried is amplitude-modulated. The antenna receives both the amplitude-modulated picture signals and the frequency-modulated sound signals that are transmitted on carriers. The carriers differ in frequency so that they may be separated in the receiver. The signals are passed to the radio frequency selector by means of which the necessary station is tuned in. The frequent-modulated signals of the found channel and the amplitude-modulated signals of the video channel pass from the converter. These signals are amplified and separated by the circuit blocks. They reach the loudspeaker and the kinescope, respectively.

Notes

to employ — использовать
channel — канал
frequency — частота
simultaneous — одновременный
to accompany — сопровождать
to televise — передавать по телевидению
to convert — превращать, конвертировать
to amplify — усиливать, расширять
carrier — носитель
to radiate — излучать
aerial — антенна
to tune in — настраивать
respectively — соответственно

Text 4

THE ELECTRON TUBE

It may be stated that the modern electronic industry was born with the invention of the electron tube. An electron tube, also called a vacuum valve, consists of a glass or metal enclosure in which electrodes are placed and sealed in either a gaseous or an evacuated atmosphere.

The simplest of electron tubes is the diode, which has two operating electrodes. One of these is the heated cathode, which emits the electrons, and the other is the plate or anode. The cathode may be directly heated or indirectly heated. The tube with the directly heated cathode utilizes the heated filament for the cathode; in this case the filament is coated with a special material, which greatly increases the number of electrons emitted. If the tube has an indirectly heated cathode, the cathode consists of a metal tube in the center of which is a filament or heater. The heater is insulated from the metal tube.

The outside of the cathode tube is covered with an electron-emitting material such as barium oxide, strontium oxide or thorium oxide.

The principal advantage of the diode tube is that it permits the flow of current in one direction only, that is, from the heated cathode to the anode. Alternating current applied to the cathode, the tube will conduct only during one half of each cycle, the cathode being negative and anode or plate being positive. For this reason diode tubes are often used as rectifiers to change alternating current to direct current. Diode tubes are used in the power-supply circuits of such electronic devices as radio and television. Another use of the diode tube is a detector (в качестве детектора).

The triode tube was discovered by adding a third element to the diode tube. The electron flowing from the cathode to the plate could be effectively controlled by changing the electrical charge on the grid placed between them. The effect of the grid in a triode makes it possible for the tube to act as an amplifier, small changes in voltage on the grid causing very substantial changes in the current flow from the cathode to the plate.

Notes

valve — электронная лампа

metal enclosure — металлический баллон

evacuated atmosphere — выкаченный воздух

to seal — опечатывать, пломбировать

to emit — испускать, выделять

filament — нить накала

alternating current — переменный ток

direct current — постоянный ток

rectifier — выпрямитель

grid — сетка

amplifier — усилитель

Text 5

BRITISH ACHIEVEMENTS IN SCIENCE AND TECHNOLOGY IN THE 20TH CENTURY

Britain has a long tradition of research and innovation in science, technology and engineering in universities, research institutes and industry. Its record of achievement in the 20th century is in many ways unsurpassed. For example, fundamental contributions to modern genetics were made through the discovery of the three-dimensional molecular structure of DNA (deoxyribonucleic acid) and of cholesterol, vitamin D, penicillin and insulin.

Notable contributions in other areas over the past 25 years have been made in improving the understanding of the nature and origin of the universe; in superconductivity (abnormally high electrical conductivity at low temperatures); in radio astrophysics; and in computer assisted tomography (a form of radiography) for medical diagnosis.

Much pioneering work was done during the 1980s. For example, in 1985 British scientists discovered the hole in the ozone layer over the Antarctic. In the same year was invented DNA fingerprinting, a forensic technique which can identify an individual from a small tissue sample. More recently there have been several British breakthroughs in genetics research, including the identification of the gene in the Y-chromosome responsible for determining sex, and the identification of other genes linked to diseases, including inherited heart disease. A vaccine has been developed to protect against cancer. The world's first pig to have a genetically modified heart has been bred by scientists at Cambridge University, an important milestone in breeding animals as organ donors for people.

Notes

unsurpassed — непревзойденный
DNA (deoxyribonucleic acid) — ДНК
tissue sample — образец ткани
breakthrough — достижение, открытие, прорыв
to breed (bred) — разводить, выращивать
milestone — веха
computer assisted — компьютерный
pioneering — исследовательский, изыскательский
ozone layer — озоновый слой
fingerprinting — снятие отпечатков пальцев
forensic — судебный
determining — определение, установление
inherited — врожденный

Text 6

ELECTRICITY AND MAGNETISM

It has been known for centuries that certain black heavy stones have the property of attracting iron, this property is called magnetism. A body that exhibits magnetism is called a magnet. The two parts of a magnet that show the strongest magnetism are called the north-pole and the south-pole.

Magnets not only affect ordinary iron, but they affect one another. When a pole of one magnet is brought toward a pole of the second magnet, they will repel if both are north-poles or both are south-poles, but they will attract if one is the north-pole and the other is the south-pole.

The region in which magnetic forces act is called a magnetic field.

When placed in a strong magnetic field, iron becomes magnetized.

Electricity and magnetism are closely connected. Almost all metals are good conductors of electricity, with copper being one of the best conductors of all. Glass, paper, rubber are the most common non-conductors or insulators.

Many practical applications have resulted from the utilization of the magnetic effect of an electric current.

These effects are used in motors, in most electric meters (amperometers, voltmeters and galvanometers), in electromagnets and practically in all electromechanical apparatus.

Notes

electricity — электричество

magnetism — магнетизм, притяжение

property — свойство

to attract — притягивать

to exhibit — проявлять, показывать

to affect — воздействовать

pole — полюс

to repel — отталкивать

conductor — проводник

non-conductor — непроводник

insulator — изолятор, диэлектрик

application — применение

utilization — использование

meter — счетчик

ammeter = amperometer

Text 7

ELECTRIC SHOCK AND SAFETY ELECTRIC SYSTEM

The strength of current depends on both the voltage and the resistance in a circuit. A current of 50 ma is dangerous for a man; it may result in an electric shock. One gets an electric shock in case one touches live conductors when the power is on. And a current of 100 ma and higher is lethal. Thus, before working on a circuit, deenergize it and work on it with the power off.

Earthing system serves to protect attending personnel from electric shocks when voltage appears on parts that are normally dead. The risk of an electric shock decreases with decreasing voltage. In wet and hot atmosphere the risk of electric shock increases. Safe voltage for circuits used in dry atmosphere is under 36 V. When the power is on contacts with live conductors are dangerous for life. When a live conductor is touched with both hands the resistance of the conductor is from 10,000 to 50,000 ohms. When a live conductor is touched with one hand the resistance is much higher. The higher is the body resistance, the smaller is the current that flows through the body. Take it into consideration and work with one hand if the power is on! Or work on the circuit with the power off!

Thus measures are taken to protect attending personnel from contacts with live parts of installations under voltage.

The danger of electric shock disappears provided the metal parts of installations under voltage are connected with ground by means of safety earthing. Connecting to ground is made by means of measuring devices. The faulty parts should be detected, eliminated, and replaced by new ones.

Notes

both ... and ... — как ..., так и ...

strength of current — сила тока

dead — не находящийся под напряжением, выключенный

live — находящийся под напряжением, включенный

safe — безопасный, допустимый

lethal — смертельный

the power is on/off — прибор включен/выключен

to deenergize — выключать, отключать

attending personnel — обслуживающий персонал

earthing — заземление

to decrease — уменьшать(ся)

to increase — увеличивать(ся), усиливать(ся)

to take into consideration — принимать во внимание

installation — установка, устройство, проводка

to disappear — исчезать

to connect — связывать, соединять

to detect — открывать, обнаруживать

to eliminate — устранять, уничтожать, исключать

faulty — зд. неисправный

to flow — течь, двигаться
provided — если, при условии
by means of — посредством, при помощи

Text 8

DIRECT CURRENT AND ALTERNATING CURRENT

When a cell or any other generator is connected so as to form a continuous path of conductors the electrons begin to move through conductors forming an electric current or an electric circuit. This phenomenon is known to be the electricity flow through a circuit. If broken anywhere, the electric circuit will stop carrying a current. There are two main types of current: direct and alternating. When electrons flow in one direction only, the current is called a direct current. When electrons flow first in one direction and then in another in a periodic manner, the current is called an alternating current.

Alternating current flows in cycles. The number of cycles per second is accepted to be termed the frequency of current. In a 60-cycle alternating current circuit, the current flows in one direction 60 times per second and in the other direction 60 times per second.

Two frequencies are in use nowadays: the standard for Europe is 50 cycles per second, while the standard for the USA is 60 cycles per second. A standard frequency has a great advantage since different electrical systems can be interconnected.

Notes

cell — элемент

circuit — эл. цепь

to term — называть, выражать

frequency — частота, частотность

to interconnect — связывать, объединять энергосистемы

cycle per second — герц

Text 9

CONDUCTORS

According to their conductivity all materials are divided into conductors, insulators and semiconductors. Conductors allow electricity to pass through them; insulators do not. Conductors are materials having a very high conductivity. A conductor owes its conducting powers to the presence of free electrons, which have broken away from their atoms. The most common of them are metals (copper, aluminium, steel, and others), carbon and electrolytes. Their coefficient of resistance is different. Copper, for example, has a positive coefficient while carbon has a negative coefficient of resistance.

According to their resistivity, conductors are divided into two groups; the first includes materials with low resistivity: copper, aluminium and others. These metals are used to produce wire conductors due to their high mechanical strength. The second group includes materials with high resistivity: one of these is nichrome. Due to its good heat resistance, nichrome is used to produce heaters. Carbon is commonly used to produce electrodes and brushes for electric machines.

Notes

according to — в соответствии с
conductivity — проводимость
to divide — разделять
conductor — проводник
insulator — изолятор
semiconductor — полупроводник
to owe — быть обязанным
carbon — углерод
resistance — сопротивление
resistivity — удельное сопротивление
nichrome — нихром
heater — нагревательный прибор

Text 10

INSULATORS

Insulating materials have a very low conductivity. They offer extremely high resistance to the flow of current. Insulators are used in electric devices to isolate conductors. Thus they should have a high dielectric strength and a high resistivity. Their mechanical properties are also important for practical use.

Insulators are divided into gaseous, liquid and solid. They are also divided into groups according to their heat resistance.

The main gaseous insulator is air. At 20°C the dielectric strength of air is extremely low; it is lower than the strength of most liquid and solid dielectrics.

Liquid insulators are mineral oils, synthetic liquids, resins, and others. Of them mineral oils are used in oil transformers, cables and capacitors. In transformers, oil is used to insulate current conducting parts. Thus, it should have a high dielectric strength (10 to 20 mV/m). As to resins, at low temperatures they are amorphous. When heated, they become first plastic, then liquid. Resins are the most important components of many plastics. (Commonly used in electrical engineering are synthetic (polymeric) resins — polyethylene). Plastics are used as wire and cable insulation. Solid insulators are paper, cloth, plastics, and porcelain. Of them plastics are widely used in electrical engineering as insulating and structural materials. As to porcelain, it is highly resistant to mechanical factors and heat. Due to this property it is used to produce low- and high-voltage insulators.

Notes

device — приспособление, механизм, устройство

to isolate — изолировать, разъединять

insulator = dielectric — диэлектрик

mineral oil — нефть, нефтепродукт

resin — смола

capacitor — конденсатор

amorphous — бесформенный, аморфный

engineering — техника

porcelain — фарфор

charge — заряд

Text 11

PLASTIC CHIPS

The microchip industry may see big news about an old substance: plastic. Plastic Logic, a new company, has developed a patented technology that allows manufacturers to print plastic onto a polymer substrate. The result is a plastic-based transistor that is inexpensive and flexible.

The principles that apply to printing on polymer are similar to those used in industrial ink jet printing. Although plastic semiconductors are not yet kings of performance (plastic inhibits electron mobility), the technology could drastically reduce production costs, because it is much less volatile than silicon. It could be useful in low-cost smart appliances. Plastic Logic has found a way to print clever materials in such a way that one can make practical circuits.

The new technology will have the most immediate impact on various types of displays, including mobile-phone screens, flat screens computer monitors, and televisions. The inclusion of plastic chips could mean that manufacturers of TFT (thin-film transistors), flat-panel screens and televisions, currently using a traditional silicon-based transistor for each pixel, would be able to switch to much cheaper chips.

Notes

to print — проводить литографию, трафаретную печать

in industrial ink jet printing — в промышленности при нанесении пасты методом струйной печати

to inhibit — мешать, препятствовать

drastically — радикально, круто, коренным образом

smart — с логическими устройствами

impact — влияние

inclusion — включение

pixel — элемент изображения

to switch to — переключаться, переходить

appliance — устройство, прибор

Text 12

COMPUTERS AND CYBERNETICS

The computers or high-speed electronic machines of today have created entirely new technical possibilities in automatic control of industrial processes. First designed for solving mathematical problems, they soon paved the way for a new field of science — cybernetics — that studies general principles of control both in life and non-live systems. The importance of cybernetics is great in the sphere of engineering sciences. A newly developed field of knowledge is technical cybernetics. Its objectives are to control automatic industrial processes, to study problems of transmission of information and to develop new principles of automatic controls.

One of the main problems of technical cybernetics is the development of control algorithms to be used in processing and control of information flows. The algorithms worked out for employment in control machines are called programs. These are based on subdivision of the computation process into simple arithmetical operations and on determination of the logical operations to be performed with a view to fulfill the program which gives the sequence of the machines and must be coded or expressed in the adopted code systems.

Two systems of computers are now created for control computer design.

One of these is the development of general-purpose control machines that may have much wider application but require more complicated logical circuitry and greater number of instructions and commands employed in the computer. This approach permits control of a great variety of industrial units with the aid of one and the same computer.

The second system utilizes modern microcomputer techniques to develop special-purpose machines designed to control a particular process. This leads to the creation of more easily operated and low-cost control computers. Tests of some control computers manufactured for specific industrial units have shown their efficiency and quite sufficient reliability.

In our country both systems of control are applied. Electronic digital computers perform both arithmetical and logical operations, making it possible to govern processes under rather complicated conditions.

Notes

cybernetics – кибернетика
entirely – всецело, совершенно
to design – предназначать, проектировать
to solve – решать, разрешать (проблему)
to pave – мостить, прокладывать, устилать
engineering sciences — технические науки
objective — цель
to work out — составлять, разрабатывать
computation – вычисление
control — управление, контроль
processing — обработка
to perform = to fulfill — выполнять, осуществлять
to adopt — принимать, усваивать
application — применение
circuitry — электрические схемы; компоновка эл. схемы
approach — подход, приближение
unit — устройство, прибор
aid — помощь
particular – особенный, особый; отдельный
low-cost — низкой стоимости

efficiency — действенность, эффективность; производительность
sufficient — достаточный
reliability — надежность, прочность
to govern — управлять, регулировать
rather — достаточно, довольно

Text 13

NETWORK

Network, in computer science, includes techniques, physical connections, and computer programs used to link two or more computers. Network users are able to share files, printers, and other resources; send electronic messages; and run programs on other computers.

A network has three layers of components: application software, network software, and network hardware. Application software consists of computer programs that interface with network users and permit the sharing of information, such as files, graphics, video, and resources, such as printers and disks. One type of application software is called client-server. Client computers send requests for information or requests to use resources to other computers, called servers that control data and applications. Another type of application software is called peer-to-peer. In a peer-to-peer network, computers send messages and requests directly to one another without a server intermediary.

Network software consists of computer programs that establish protocols, or rules, for computers to talk to one another. These protocols are carried out by sending and receiving formatted instructions of data called packets. Protocols make logical connections between network applications, direct the movement of packets through the physical network, and minimize the possibility of collisions between packets sent at the same time.

Network hardware is made up of the physical components that connect computers. Two important components are the transmission media that carry the computer's signals, typically on wires or fiber-optic cables, and the network adapter, which accesses the physical media that link computers, receives packets from network software, and transmits instructions and requests to other computers. Transmitted information is in the form of binary digits, or bits (1s and 0s), which the computer's electronic circuitry can process.

Notes

to run — управлять
intermediary — промежуточное звено, посредник

to share — обмениваться
software — программное обеспечение
hardware — аппаратное, техническое обеспечение
request — запрос
application — программа
to carry out — выполнять
to direct — управлять, направлять
medium (pl. media) средство, среда

Text 14

WORLD WIDE WEB

World Wide Web (WWW) is a computer-based network of information resources that a user can move through by using links from one document to another. The information on the World Wide Web is spread over computers all over the world. The World Wide Web is often referred to simply as “the Web”

The Web has become a very popular resource since it first became possible to view images and other multimedia on the Internet, a worldwide network of computers, in 1993. The Web offers a place where companies, institutions, and individuals can display information about their products, research, or their lives. Anyone with access to a computer connected to the Web can view most of that information. Museums, libraries, government agencies, and schools make the Web a valuable learning and research tool by posting data and research. The Web also carries information in a wide spectrum of formats. Users can read text, view pictures, listen to sounds, and even explore interactive virtual environments on the Web.

Like all computer networks, the Web connects two types of computers — clients and servers — using a standard set of rules for communication between the computers. The server computers store the information resources that make up the Web, and Web users use client computers to access the resources. A computer-based network may be a public network — such as the worldwide Internet — or a private network, such as a company's Intranet. The Web is part of the Internet.

Enabling client computers to display Web pages with pictures and other media was made possible by the introduction of a type of software called a browser. Each Web document contains coded information about what is on the page, how the page should look, and to which other sites the document links. The browser on the client's computer reads this information and uses it to display the page on the client's screen. Almost every Web page includes

links, called hyperlinks, to other Web sites. Hyperlinks are a defining feature of the Web — they allow users to travel between Web documents without following a specific order or hierarchy.

Notes

to spread — распространяться

link — ссылка

to be referred to — называться

set of rules — свод правил

to store — хранить, запоминать

feature — черта

Text 15

CELLULAR COMMUNICATION AND MOBILE INTERNET

Telephone, television, cellular communication and W. W. W. (World Wide Web — Internet) — all these are different conceptions creating an enormous net for mankind.

Mobile Internet is the main "know-how"; it is a break into and out of the borders.

In the West millions of non-business people, even housewives have two or three apparatus of cellular communication.

Speed is the main problem of today in that sphere of technology, which is linked in our sense with an ordinary telephone receiver.

Mobile Internet and mobile video are impossible without speed, as the speed of data transmitting is the main problem nowadays.

By the year 2004 there will be 120 millions users of Mobile Internet and every fourth user will do it with the help of cellular communication for working in the W. W. W. Different services of banks, shopping, booking tickets for all kinds of transport, for cinemas, exhibitions, theatres — all these will be accessible at any time and place.

By the year 2001 more than a half subscribers of mobile nets will use WAP (Wireless Application Protocol) — it is an electronic language worked out especially for the Mobile Internet.

Most devices of cellular communications will be exposed as an Internet Language.

The electronic mail, voice messages, trade, bank operations, etc. will be carried out with their help.

With the help of high technology there is a tendency to obtain the speed of 11 megabits per second, comparing with the speed of 9,8 kilobits nowadays.

Using Internet mankind will have cellular voice and video communication nets all over the world, and its ring will cost not more than a local ring.

Notes

cell — (биол) клетка, ячейка, сота; (эл) элемент

cellular — сотовый

communication — связь, сообщение, средство связи

data — данные, факты, информация

subscriber — абонент

Text 16

FACSIMILE TRANSMISSION

Facsimile Transmission is a communication system that copies, sends, and receives documents by way of telephone lines. Also called faxing, this method of communication allows people to share exact copies of important papers by duplicating and sending them on one end, and then receiving and reproducing them on the other.

Facsimile machines came into use in the early 20th century when newspaper companies began using them to transmit photographs between branch offices. By the mid-1980s use of desktop facsimile machines had become commonplace for business and personal correspondence throughout the world. In the 1990s many people have used personal computers to send and receive facsimile transmissions, or faxes, eliminating the need for a separate facsimile machine. In the latter half of the decade, Internet fax services grew increasingly popular. These services provide the ability to receive faxes to anyone who has Internet access.

Personal computers can imitate the operation of fax machines. Computer-based faxing enables people to transmit electronic computer files as faxes to another computer or to a conventional fax machine.

To send and receive facsimile transmissions, a computer must be equipped with faxing software and a fax modem, and it must be connected to a telephone line. The faxing software prompts the computer user to enter the fax number of the receiving computer or fax machine. The software compresses the file so it can be transmitted more efficiently, and then sends

it to the fax modem. The modem converts digital computer files into analog signals so they can travel via telephone lines.

The fax modem of the receiving computer reconverts the analog telephone signal into a digital computer file. The faxing software on the receiving machine decompresses the file, and then notifies the computer user that a fax has been received. The receiver may choose to either view the fax in its electronic format or print it.

Notes

branch — отделение, филиал

conventional — обычный

to prompt — побуждать; напоминать

to notify — извещать, уведомлять

Библиотека БГУИР

Text 17

LASER

Laser is an acronym for light amplification by stimulated emission of radiation. Lasers are devices that amplify light and produce coherent light beams, ranging from infrared to ultraviolet. A light beam is coherent when its waves, or photons, propagate in step with one another. Laser light, therefore, can be made extremely intense, highly directional, and very pure in color. Laser devices now extend into the X-ray frequency range. Based on the laser medium used, lasers are generally classified as solid state, gas, semiconductor, or liquid.

Lasers have become valuable tools in industry, scientific research, communication, medicine, the military, and the arts.

Powerful laser beams can be focused on a small spot with enormous power density. Consequently, the focused beams can readily heat, melt, or vaporize material in a precise manner. Lasers have been used, for example, to drill holes in diamonds, to shape machine tools, to heat-treat semiconductor chips, to synthesize new material. The powerful short laser pulse also makes possible high-speed photography with an exposure time of several trillionths of a second.

They are also the most effective detectors of certain types of air pollution. In addition, lasers have been used for precise determination of the earth-moon distance and in tests of relativity. Very fast laser-activated switches are being developed for use in particle accelerators, and techniques have been found for using laser beams to slow down atoms for extremely precise studies of their spectra.

Because laser light is highly directional and monochromatic, extremely small amounts of light scattering or small frequency shifts caused by matter can easily be detected. By measuring such changes, scientists have successfully studied molecular structures of matter. With lasers, the speed of light has been determined to an unprecedented accuracy, chemical reactions can be selectively induced, and the existence of trace substances in samples can be detected.

Laser light can travel a large distance in outer space with little reduction in signal strength. Because of its high frequency, laser light can carry, for example, 1,000 times the television channels today carried by microwaves. Lasers are therefore ideal for space communications. Low-loss optical fibers have been developed to transmit laser light for earthbound communication in telephone and computer systems. Laser techniques have also been used for high-density information recording. For instance, laser light simplifies the recording of a hologram, from which a three-dimensional image can be reconstructed with a laser beam. Lasers are also used to play audio CDs and videodiscs.

Intense, narrow beams of laser light can cut and cauterize certain tissues in a small fraction of a second without damaging the surrounding healthy tissues. They have been used to "weld" the retina, bore holes in the

skull, vaporize lesions, and cauterize blood vessels. Laser techniques have also been developed for lab tests of small biological samples.

Laser guidance systems for missiles, aircraft, and satellites have been constructed. The use of laser beams has been proposed against hostile ballistic missiles.

Notes

acronym — акроним, аббревиатура

in step — последовательно, ступенчато

power density — концентрация энергии

exposure time — время экспозиции, выдержки

laser-activated switches — переключатель, управляемый лазерным лучом

light scattering — рассеяние светового пучка

frequency shift — сдвиг частоты

unprecedented accuracy — беспрецедентная точность

to induce — вызывать, индуцировать

low-loss optical fibers — оптоволокно с малыми потерями

earthbound — земной, связанный с Землёй

cauterize — прижигать

fraction — доля, часть, дробь

retina — сетчатка

bore — сверлить

lesion — повреждение, поражение (тканей, органов)

blood vessels — кровеносные сосуды

sample — образец

hostile ballistic missiles — вражеские баллистические ракеты

Text 18

MODEM

Modem is a device that enables computers, facsimile machines, and other equipment to communicate with each other across telephone lines or over cable television network cables. In the strictest sense, a modem is a device that converts between analog signals, such as sound waves, and digital signals, which are used by computers. However, the term has also come to include devices that permit the transmission of entirely digital signals.

Modems transmit data at different speeds, measured by the number of bits of data they send per second (bps). A 28.8 Kbps modem sends data at 28,800 bits per second. A 56 Kbps modem is twice as fast, sending and receiving data at a rate of 56,000 bits per second.

An analog modem converts the digital signals of the sending computer to analog signals that can be transmitted through telephone lines. When the signal reaches its destination, another modem reconstructs the original digital signal, which is processed by the receiving computer. A standard analog modem has a maximum speed of 33.6 Kbps.

The word modem is an acronym formed from the two basic functions of an analog modem: modulation and demodulation. To convert a digital signal to an analog one, the modem generates a carrier wave and modulates, or adjusts, it according to the digital signal. The kind of modulation used depends on the application and the speed of operation for which the modem is designed. The process of receiving the analog signal and converting it back to a digital signal is called demodulation.

Cable modems permit the transmission of data over community antenna television (CATV) networks — that is, the network of cables used to distribute cable television. A cable modem transmits data from the network at about 3 Mbps and transmits data to the network at between 500 Kbps and 2.5 Mbps.

Like a standard analog modem, a cable modem converts between a digital signal and an analog signal. Cable modems are much more complex than standard analog modems. They also incorporate a tuner that separates the digital data from the rest of the broadcast television signal. Because users in multiple locations share the same cable, the modem also includes hardware that permits multiple connections and an encryption/decryption device that prevents data from being intercepted by another user or being sent to the wrong place.

Notes

to reach — достигать

carrier wave — несущая

community antenna television network — сеть телевизионных

коллективных антенн

broadcast — передача, трансляция

to share — владеть, разделять

encryption/decryption — шифрование/дешифрирование

to prevent from — препятствовать, не допускать

to intercept — перехватывать

Библиотека БГУИР

Text 19

DAMAGE DONE

Top Ten Viruses in 2000		Infection rate
Kakworm	Attaches automatically to every outgoing e-mail.	17,0%
Love Bug	Self-replicates through Microsoft Outlook; renames files.	14,5%
Apology-B	Sends a second e-mail with the virus after any outgoing e-mail.	8,9%
Marker	Transfers Word file properties to the Codebreakers Web site.	6,5%
Pretty	E-mails a copy of itself to Windows address book citations.	5,6%
Stages-A	Attempts to create copies of itself on all available network drives.	3,5%
Navidad	Reads e-mail messages; sends itself to the sender.	3,4%
Ska-Happy 99	Sends a second e-mail with the virus after any outgoing e-mail.	2,3%
Thus	Attempts to delete data on the trigger date, December 13.	2,1%
Jini	Renames all items in the Excel File menu.	2,0%
Others		34,2%

The Kakworm virus did more damage than any virus in 2000, affecting 17% of computers, according to Sophos, an antivirus solutions company that released of the Top Ten Viruses in 2000. The Kakworm virus, which exploits security vulnerabilities in Microsoft Internet Explorer and Microsoft Outlook, never dropped out of the top three most common viruses for any month in 2000. Microsoft's release of a patch to stave off Kakworm did little to stem the tide of chronic infections, because few users have downloaded the fix.

Despite the attention Love Bug virus didn't have staying power; it came in second on Sophos's list. Rounding out Sophos's top five viruses in 2000 were viruses dubbed Apology-B, Marker and Pretty. Together these five viruses accounted for 52,5% of all calls placed to Sophos in 2000.

Many antivirus experts recommended that individuals drastically reduce their vulnerability to viruses by following some simple steps.

First, make sure any antivirus software contains up-to-date virus definitions. Many PC users think that just owning antivirus software is enough. But users should periodically make sure that virus definitions are up to date. This step alone would drastically reduce the number of infections.

Next, users should use the same caution opening their e-mails as they do opening their front doors. These days many viruses masquerade as vanity messages (such as "I love you" and "I'm sorry") or harmless downloads with cute appeal. Users should treat all messages as a potential danger to their systems. The problem with viruses is not antivirus software, but rather the people who fall for the same confidence game again and again. To avoid the problem people shouldn't send screen savers and jokes, because they increase the chance of infection.

Notes

trigger — фактор, имеющий роль пускового механизма, стимул

to exploit — использовать

security vulnerability — уязвимость системы защиты

to drop out — выходить, выбывать

patch — "заплата", вставка программы (с целью исправления или изменения)

to stave off — предотвратить (опасность)

to stem — останавливать, задерживать

fix — затруднительное положение

to dub — давать прозвище, окрестить

to masquerade — выдавать себя за

vanity messages — лестные послания

to fall for — попадаться на удочку, подвергаться обману

Text 20

Data Transport Through a Speedy World

One hundred years ago people communicated exchanging letters, fifty years ago it was a telephone call, and in the 1980s personal computers and fax machines were the technology du jour. In the telecommunications age, the demand for greater bandwidth, more storage capacity, and accelerated data transport speeds is increasing faster than you can click on your send button. When choosing a transport media you should consider the amount of bandwidth that is guaranteed (bandwidth is the ability to transport data). Different ranges of bandwidth are necessary for different applications.

The most common methods of data transport are telephone lines, wireless communications, the Internet and fiber optics. A standard telephone line can only handle 56k (one k = 1000 bits); most standard wireless systems can give 10Mb of bandwidth. Today's highest speed on the Internet is 45Mb/sec on major trunk lines, and most Internet users access the Web at around 56K. Fiber has close to unlimited bandwidth and can be broken up into many streams of light carrying 194 Mb.

Since the early 1960s when the first communications satellite was launched, the satellite aerial/wireless industry has exploded. Communications satellites provide a worldwide link-up of radio, telephone and television.

The wireless system consists of a receiver and transmitter located at each end of the connecting sites. These transceivers relay information to each other via radio signals.

Telephone line is the most commonly used communications device. With today's transmission of video and data, a standard telephone line has only enough bandwidth to transmit 56 k data and either analog or digital voice. In order to transmit video over telephone lines, a CODEC (a compression / decompression device that breaks up the video and data into packets) is required.

As digital trend grows, copper wire utilized for long distances has been replaced by glass cables as thin as strand of hair. Fiber-optic cable offers increased call-carrying capacity, higher speed, and greater transmission quality. The fiber-optic transmission is based on the principle of total internal reflection. Light travels inside the core of the fiber and reflects any light trying to escape from the core. Fiber-optic cable carries information in the form of digital bursts of light, at data rates that are thousands of times greater than those of normal phone lines.

The Internet is a network that contains assorted media, computers, and applications. Today the Internet is over-utilized and bandwidth limited. As the number of online users multiplies, the amount of space on the Web and the bandwidth availability decreases.

Internet II, a higher speed network currently being developed, may go a long way towards solving these problems.

No matter which mode of transport a consumer chooses, limitations exist in every one of them. It is important to understand how to get the most from a chosen medium.

Notes:

du jour – (франц) современный
application – программа
bandwidth – ширина полосы частот
to handle – обрабатывать, управлять
trunk line – магистральная линия
close to – около, почти
to launch – запускать
aerial – антенна
wireless – беспроводной, радио-
to explode – внезапно и быстро развиваться

link-up – соединение, связь
compression – сжатие данных
strand of hair – прядь волос
core – сердцевина, жила кабеля
bursts of light – вспышки света
rate – темп, скорость
assorted – подходящий, соответствующий
availability – наличие, готовность данных
limitation – ограничение
consumer – потребитель

Библиотека БГУИР

Учебное издание

Сборник текстов по английскому языку для студентов 1-го курса ФВО

Составители: Елисеева Полина Геннадьевна,
Войтова Инна Владимировна,
Семенов Александр Николаевич

Корректор Е.Н. Батурчик

Подписано в печать

1/16

Бумага

Уч.-изд.л.

Заказ

Печать

Формат 60x84

Усл.печ.л.

Тираж 100 экз.

Издатель и полиграфическое исполнение:

Учреждение образования

«Белорусский государственный университет информатики и
радиоэлектроники»

Лицензия ЛП №156 от 05.02.2001.

Лицензия ЛВ №509 от 03.08.2001.

220013, Минск, П. Бровки, 6.