ФГБОУ ВО «Воронежский государственный технический университет»

Естественно-технический колледж

МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ

- 2017

для практических занятий и самостоятельной работы студентов по дисциплине «Иностранный язык» для студентов 4 курса специальности 11.02.01 Радиоаппаратостроение

Воронеж 2017

Составитель преп. И.В. Полухина
УДК 372.881.111.1
Методические рекомендации для практических занятий и самостоятельной работы студентов по дисциплине «Иностранный язык» для студентов 4 курса специальности 11.02.01 Радиоаппаратостроение. /ФГБОУ ВО «Воронежский государственный технический университет»; сост. И.В. Полухина. Воронеж, 2017. 31 с.

Данные методические рекомендации предназначены для студентов 4 курса Естественно-технического колледжа специальности 11.02.01 Радиоаппаратостроение, продолжающих изучение английского языка для профессиональных целей в соответствии с ФГОС СПО. Они рассчитаны на 30-40 аудиторных и 8-10 часов самостоятельной работы студентов. Цель методических рекомендаций – подготовить обучающихся к чтению и переводу англоязычной профессиональной документации.

Методические рекомендации подготовлены в электронном виде и содержатся в файле МР АНГЛ.pdf

Библиогр.: 5 назв.

Рецензент канд. филол. наук, доц. А.А. Падурец
Ответственный за выпуск директор ЕТК ВГТУ
А.А. Долгачев

Издается по решению учебно-методического совета Воронежского государственного технического университета

Целью обучения английскому языку для профессиональных целей, как компонента программы подготовки специалиста среднего звена, в соответствии с ФГОС СПО для специальности 11.02.01 Радиоаппаратостроение является: формирование языковой, речевой и социокультурной компетенций; овладение обучающимися элементами непосредственного и навыками опосредованного общения на английском языке для последующего использования и совершенствования сформированных в процессе обучения общих компетенций в профессиональной, учебной и бытовой деятельностях.

Цель занятий: совершенствование умений профессионально ориентированного устного и письменного общения по заданной теме.

Задачи занятий:

– совершенствование умений просмотрового и поискового чтения текстов, профессионально ориентированной тематики;

– совершенствование навыков перевода;

– развитие умений оформления устного и письменного сообщения по заданной теме;

– совершенствование умений обработки информации при помощи информационно-коммуникативных технологий;

– развитие когнитивных умений анализировать, обобщать информацию, делать выводы;

– совершенствование мотивационной составляющей для изучения английского языка у студентов, за счёт использования информации, касающейся сферы их профессиональных интересов, с учётом междисциплинарных связей.

MOBILES — USEFUL OR DANGEROUS?

Why are mobiles so popular? Because people love to talk to each other. And it is easier with a mobile phone. People think mobile phones are fun and useful. In countries like Russia and China, people use mobile phones in places where there is no ordinary telephone. Business people use mobiles when they're travelling. In some countries, like Japan, many people use their mobile phones to send e-mail messages and access the Internet. They use a new kind of mobile phone called "i-mode". You can even use a mobile phone to listen to music.

Mobile phones are very fashionable with teenagers. Parents buy mobile phones for their children. They can call home if they are in trouble and need help. So they feel safer. But teenagers mostly use them to keep in touch with their friends or play simple computer games. It's cool to be the owner of a small, expensive mobile! As eighteen-year-old Londoner Rosie Farrer says, "Before, girls of my age smoked cigarettes to look good. Now we have mobiles!". Rosie's right. Research shows that teenage owners of mobile phones smoke less! Parents and schools are happy that teenagers are safer and smoke less. But they are worried about the possible problems of mobile phones.

There are now 750 million mobile phone users around the world. This number will probably grow to 1.4 *billion* in five years' time. Many people dislike them. They hate it when the businessman opposite them on the train has a loud conversation on his phone. Or when mobile phones ring in a café or restaurant.

But there is a much more serious problem. We are not sure that mobiles are completely safe. It's possible that mobiles can heat up the brain because we hold the phone so close to our head. Scientists fear that mobiles can perhaps be bad for your memory and even give you cancer. Because of these fears, some people use a "handsfree" mobile — a phone that you needn't hold to your ear. But it is possible that these are *more* dangerous. We just don't know and many parents don't give their younger children mobiles for this reason.

So why *do* we use mobiles when we aren't sure they're safe? Because mobiles are a lot of fun and very useful, we choose to forget the possible dangers. We choose to believe that mobiles *are safe*. Let's hope we're right!

1. Match 1-10 with a-j to make sentences.

1. We believe that the number of mobile phone owners
2. Because it is easier to keep in touch with a mobile phone
3. In Japan "i-mode" phones are used
4. Mobile phones are very popular
5. Teenagers often smoke less
6. If you are in trouble and need help
7. It's possible that mobile phones may
8. With a "handsfree" mobile,
9. "Handsfree" mobiles could be more dangerous
10. We know about the possible dangers, but

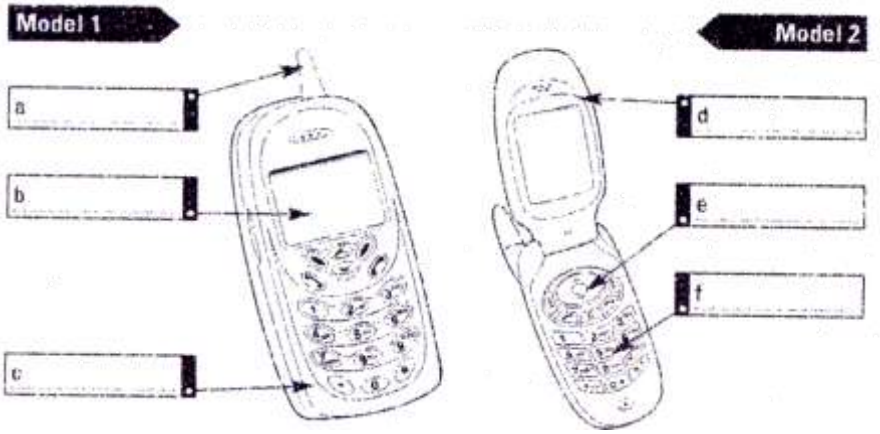
a. you don't hold the phone to your head
b. than ordinary mobile phones.
c. we continue to use mobiles.
d. to send e-mail messages and access the Internet.
e. with teenagers.
f. will grow a lot in the next five years.
g. be bad for your memory and give you cancer.
h. a mobile can be very useful.
i. if they own a mobile phone.
j. they are very popular.

2. Answer the questions. Then discuss in pairs.

a. Do you use a mobile phone?
b. What do you use it for? Make a list.
c. When is it a good or a bad time to make/receive mobile phone calls?

3. Label the parts of the mobile phones with the words in the box

antenna • lip cover • display screen • faceplate • keypad • scroll keys



4. Read the advert. Which phone is best for a business and which is best for a student? Which one do you like more? Why?

The New Brighton QT1

This new super-cool model gives you the best in mobile phones

- multimedia messaging to send snapshots to your friends
- downloadable games, graphics and music
- infrared signal transmission to your computer (no cables!)
- voice-activated dialing — just speak to call
- programmable ring tones so you know who is calling before you answer

The SP5 Deluxe

Everything you need in mobile technology!

- multimedia messaging with pictures and video
- make calls while browsing the Web
- digital and analog band modes for town and country
- voicemail to send messages to your office
- large screen with 6 text lines for text messages

- detachable faceplates so you can change it to match your clothes
- antenna for clearer reception
- large key pad and scroll keys for easy navigation
- Personal Information Manager (PIM) for your appointment schedule
- wireless connection to your PC and headset

SPECIFICATIONS	
BAND MODE	digital
TALK TIME	4 hours
STANDBY	5 days
DIMENSIONS	8×4×1 cm

SPECIFICATIONS	
BAND MODE	dual
TALK TIME	5 hours
STANDBY	7 days
DIMENSIONS	5.5×4×1 cm

5. Which mobile phone has these features? Write ***QT1****,* ***SP5*** *or* ***Both****.*

1. can work anywhere …
2. a diary …
3. a camera …
4. no cables …
5. faceplates you can change …
6. a one-week standby time …
7. rings tones you can program …
8. games you can download

6. Write a paragraph about the mobile phone you have or the one you would like to have.

7. Use the Internet or magazines to find a new, up-to-date mobile phone. Make a list of the features it has and report back to the class.

IT WORKSHOP Oxford University Press

Найдите в тексте слова ***cell, network, area, set*** *и выберите правильное определение в данном контексте.*

A cellular phone (cellphone) is a lightweight, portable radio transceiver, which can transmit and receive calls anywhere in cellular network area. It is a mobile telephone, which communicates through base stations situated in areas called cells. Cell is a subdivision of communication area in a cellphone network. In the network, the same frequencies can be used for many different telephone calls at the same time. Each cell has its own small electronic base station and set of transmission frequencies. The sizes of the cell vary between 1 km to about 30 km across, depending on the output power of the cellphone transmitter.

1. *cell*
a) a small room for one person
b) apparatus for producing electricity by chemical action
c) a compartment in a larger structure (e.g., in a honeycomb)

2. network
a) a system of lines that cross
b) a complex system if interconnected radio and TV devices
c) a connected system

3. area
a) a zone, region, district
b) surface measure
c) range of activity

4. set
a) a number of smth. of the same kind
b) radio, TV, phone apparatus
c) direction

Подберите к глаголам и словосочетаниям в колонке А глаголы с тем же значением из колонки В.

A	B.
1. link up to	a. contain
2. exchange news	b. connect
3. send a signal, message, fax	c. replace
4. show	d. make it difficult and impossible to read
5. take the place of	e. own
6. have, possess	f. communicate
7. make it illegible	g. transmit h. indicate
8. have	

Translate the marked words.

TELEVISION

It is true that an important thing can have a small beginning. A tiny nine-by-twelve inch box was the centre of attention for hundreds of people at the 1939 World's Fair in New York. They were the first to see a television set in action. *Compared* to today's TV shows of underwater and outer space *research,* those first black-white pictures were not very good. The pictures were only *transmitted* from one side of the Fair territory to the other. But in 1939 they were of historical importance.

Within a few days the news of television spread throughout the

world. A lot of people wanted *to have a look at* the new invention. Everyone was interested in it. But only few people owned television sets in the next few years. When World War II *broke out* electronic factories that began the TV production stopped making them and started making war materials instead. When the war was over, TV sets began coming off factory assembly lines. By 1958 there were millions of them.

In a surprisingly short time people watched fewer films and turned from newspapers and magazines to TV. In its short history television has had great *influence* on people's life and way of thinking. Rocket-launching, concerts and football and tennis matches can be seen as they *occur*. The boundaries of time and space have disappeared.

At present TV communication is provided with the help of a system of *artificial earth satellites* so that people living in different parts of the country and all over the world and in different time zones *are able to* watch the central TV programs at the most *convenient* hours.

Nowadays many countries also have cable TV, a system using wires for the transmission of television programs (like telephone calls). Cable television first *appeared* in 1949 as a *means* of transmitting TV signals to rural and mountain areas far from big cities. Cable television's next big step forward was made by the mid - 1980s. Scientists announced that many technical problems had been solved and in the future it would be possible via satellite and cable TV to use more channels on a TV set at every home in the world.

Then we saw how a new technical invention, colour television, was *rapidly* replacing black-and-white television. Recently it was reported that the first *pocket-size* colour television set had been developed. It was *stated* that a *liquid-crystal display* was used similar to those on calculators and watches and that it *weighed* less than a pound.

A few years ago it became evident that the next major advance for TV would be digital television. In a digital system the usual *continuous* signal is replaced by a digital code *containing* detailed

information on brightness, colour, etc. A digital TV set hangs on the wall like a picture. *Essentially,* it is a minicomputer with a visual display. *Once a week* you put the programs you likelnto the memory, and TV set will automatically *switch on* the desired channel at the right time. You can watch several programs *simultaneously* on miniscreens and then produce one of them in full format. Also, the TV set can automatically video-record the programs when you are absent or *occupied.*

By the end of 1980s television has moved to a new and the most important stage in its development since the appearance of colour television. Technically it is called *high-definition television (HDTV)* or Fli-Vision. This is a television of the 21-st century. This revolution was started by Japanese manufacturers when they developed a new video system with a picture resembling a wide-screen film more than traditional television. The new system doubles the number of lines, as well as increases the screen's width-to-height ratio. The result is a picture five times shaper than in the existing TV sets. This revolutionary system was used during the Seoul Summer Olympics. Since 1990 a new communication satellite has begun to offer regular Hi-Vision service direct to tiny antennae on houses' roofs. By the year 2000 HDTV *equipment* will likely find its application not only in homes, but also in industry, medicine, even film production.

1. Укажите, какие из следующих утверждений соответствуют содержанию текста.

1. A lot of people owned television sets in the first years after its invention.
2. First television black-and-white pictures were excellent.
3. But only few people owned television sets in the next few years after their appearance.
4. Black-and-white television was rapidly replacing colour television.
5. First television black-and-white pictures were not very good.
6. Only a few years ago colour television was rapidly replacing black-and-white television.

7. When the war was over, TV sets stopped coming off factory assembly lines.
8. After World War II TV sets began coming off factory assembly lines.

2. Ответе на вопросы:
1. When did the first TV set appear? 2. Were people interested in new invention? 3. What is cable television? 4. What is digital television? 5. What is high-definition television?

THE INTERNET

Read the text. Do exercises.

The internet is **a medium** with which we can view information from anywhere in the world. Documents from the World Wide Web and various other services such as **instant** chat, email are **available** through the internet. Most of the time, everyone thinks that the internet and the W3 are the same, however this is not true. The internet is a network of cables, which allow users to access information of various sorts.

The data is transmitted through the Internet Protocol, which is known as the IP. Each computer will have **a separate identity** when it comes to the use of the internet. Though the internet was available, it only became *a household word* in the year 1996. But at the beginning, the use of the internet was very expensive. Most of the users went to public centers to use the internet for a high price per hour.

As the use became more popular, there was an increase in the speed of the internet and also decrease in cost. Networks were planned, and looking at the money, many service providers entered the market. They made it very simple for all users, and the use of the internet became very cheap. Everyone at home could **afford** to get a connection, and now most users will have **unlimited access** *as well*

This has made it possible for many people **to benefit**. Those who are unable to go out may get **opportunities** to work from home.

Various other doors have been opened to the **average** human, and everyone has taken advantage of the *creation*. Almost every individual uses the internet where it is available, *irrespective* of age groups. This medium *caters* to the needs for all age groups.

The internet has made a lot of activities very easy. The medium is used for almost all **purposes**, even with important *issues* such as education and government organizations. It has come a long way from the use with only scientific organizations and institutes etc. There was a phenomenal growth in the years 1996 and 1997. The growth for the internet has been at around hundred percent per year.

Majority of the users use the English language for the internet, as computer development happened in America in all stages. There are other languages as well, such as French, German, Chinese and Arabic. Internet has also made life easy because we can view through various means.

www.articlesbase.com/internet-articles

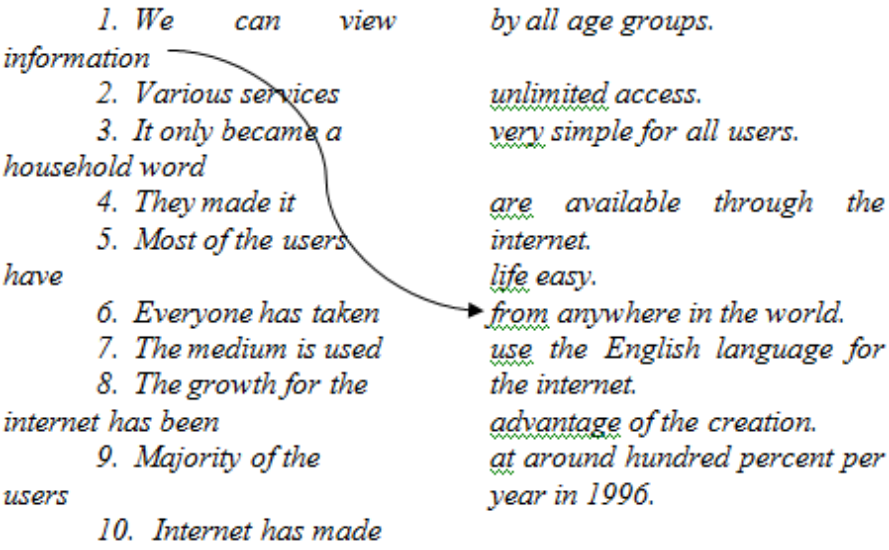
1. *Explain the meaning of the marked words.*
2. *Are internet and the W3 the same? What is the difference?*
3. *This article describes the Internet advantages and what are its disadvantages?*

Think of your own, when answering use the following phrases:

To my mind…, I think…, It is better to say…, It is difficult/easy to …, And other

parenthesis words (вводные слова).

Match the parts of the sentences.



ELECTRON EMISSION

depend – зависит
carrier – носитель переносчик (энергии)
ordinary – обычный
surface – поверхность
substance - пределы
attract - притягивать
except - исключать
sufficient - достаточный
external - внешний
thermionic – термоэлектронный

The electron tube depends for its action on a stream of electrons that act as current carriers. To produce this stream of electrons a special metal electrode (cathode) is present in every tube. But at ordinary room temperatures the free electrons in the cathode cannot leave its surface because of certain restraining forces that act as a barrier. These attractive surface forces tend to keep the electrons within the cathode substance, except for a small portion that happens to have sufficient kinetic energy (energy of motion) to break through the barrier. The majority of electrons move too slowly for this to happen.

To escape from the surface of the material the electrons must perform a certain amount of work to overcome the restraining surface forces. To do this work the electrons must have sufficient energy imparted to them from some external source of energy, since their own kinetic energy is inadequate. There are four principal methods of obtaining electron emission from the surface of the material: thermionic emission, photoelectric emission, field emission and secondary emission.

Thermionic emission. It is the most important and one most commonly used in electron tubes. In this method the metal is heated, resulting in increased thermal or kinetic energy of the unbound electrons. Thus, a greater number of electrons will attain sufficient speed and energy to escape from the surface of the emitter. The number of electrons released per unit area of an emitting surface is related to the absolute temperature of the cathode and a quantity of the work an electron must perform when escaping from the emitting surface.

The thermionic emission is obtained by heating the cathode electrically. This may be produced in two ways: 1. by using the electrons emitted from the heating spiral for the conduction of. current (direct heating) or 2. by arranging the heating spiral in a nickel cylinder coated with barium oxide which emits the electrons (indirect heating). Normally, the method of indirect heating is used.

Photoelectric emission. In this process the energy of the light radiation falling upon the metal surface is transferred to the free

electrons within the metal and speeds them up sufficiently to enable them to leave the surface.

Field or cold-cathode emission. The application of a strong electric field (i.e. a high positive voltage outside the cathode surface) will literally pull the electrons out of the material surface, because of the attraction of the positive field. The stronger the field, the greater the field emission from the cold emitter surface.

Secondary emission. When high-speed electrons suddenly strike a metallic surface they give up their kinetic energy to the electrons and atoms which they strike. Some of the bombarding electrons collide directly with free electrons on the metal surface and may knock them out from the surface. The electrons freed in this way are known as secondary emission electrons, since the primary electrons from some other source must be available to bombard the secondary electron-emitting surface.

1. Review questions:

1. What does the action of the electron tube depend on?
2. What is present in every tube to produce the stream of electrons?
3. At what temperatures free electrons cannot leave their surface of the cathode?
4. What forces tend to keep the electrons within the cathode substance?
5. What must the electrons do to escape?
6. What must the electrons have to overcome the restraining surface forces?
7. How many methods are there for obtaining electron emission?
8. What are they?
9. What imparts the external energy to the electrons in thermionic emission?
10. What energy is used for producing free electrons in photoelectric emission?
11. What is field emission?

12. How is secondary emission obtained?
13. What emission is the most commonly used in electronics?

2. Make up an abstract of the text basing on the answers to the above questions.

3. Translate the international words without a dictionary.
cathode, emitter, material, cylinder, portion, energy, radiation, temperature, thermal, adequate, absolute, special, emission, electron, normally

4. Define to what parts of speech these words belong and translate them:
realize, equalize, electrify, classify, originate, strengthen, widen, increasingly, widely, likewise, otherwise, forward, towards, upward, outward, downward

5. Translate these antonyms and memorize them:
1. be present *(v),* be absent
2. primary *{ad}),* secondary
3. relative *(adj),* absolute
4. outside *(adj),* inside
5. majority *(n)* minority
6. common *(adj),* special
7. external *(adj),* internal
8. slow *(adj),* quick, rapid
9. free *(adj),* bound
10. strong *(adj),* weak

6. Translate these words and word combinations and learn them:
because of, since, except for, a number of, the same, within, in this way, suddenly, sufficiently, literally

DIODE CHARACTERISTICS

1. The relation between the plate current in a diode and the plate-to-cathode voltage just discussed can be represented by a characteristic curve, obtained by plotting the plate-current I_a values

for different values of the applied plate voltage E_a.

2. The diode the characteristic of which is to be determined is connected in circuit in the manner shown in Fig. 1. Heating voltage and heating current are kept constant while the tube characteristic is being obtained. Plate current is being increased by steps by adjusting the variable resistor R_a connected in the same way as a potential divider. The anode current and voltage are indicated.

3. The diode characteristics for a typical diode tube and various cathode operating temperatures are shown in Fig. 2. It is seen from Fig. 2 that all the curves are the same at low plate voltages, where the negative space charge is most effective in limiting the flow of electrons. The plate current - in the low plate-voltage region is completely controlled by the voltage at the plate and is independent of the cathode temperature. Under these conditions the plate current is said to be space-charge limited.

4. As the plate voltage is made progressively higher, an increasingly greater portion of the total supply of emitted electrons are attracted to the plate and the effect of the space charge is eventually completely overcome. This is seen by the flattening of the characteristic curves, as the plate voltage is increased. When the entire supply of emitted electrons at a given cathode temperature is attracted to the plate, the plate current becomes independent of the plate voltage and reaches a constant value equal to the total emission current. Emission saturation takes place and the plate current is said to be emission-limited in the high plate-voltage region.[1] The foregoing has already made it clear that the principal advantage of the diode tube is that it permits the flow of current in one direction only, that is from the cathode to the anode. For this reason diode tubes are often used as rectifiers to change alternating current to direct current.

Commentary

1. Emission saturation takes place and the plate current is said to be emission-limited in the high plate-voltage region. — Происходит эмиссионное насыщение и считается, что анодный ток достигает насыщения в области высоких напряжений

1. *Review questions:*

1. What does a diode characteristic show? 2. What is kept constant while the tube characteristic is being obtained? 3. What controls the plate current in the low plate-voltage region? 4. What is independent of the cathode temperature? 5. Under what conditions is the plate current said to be space-charge limited? 6. When does the emission saturation take place? 7. Why are the diode tubes used as rectifiers? 8. What current do they rectify?

2. *Make up an abstract of the text basing on the answers to the above questions.*

3. *Translate the international words without a dictionary:* anode, diode, effect, characteristic, constant, total

CATHODE-RAY TUBES

Cathode-ray tubes are widely used in various branches of radio engineering such as oscillography, radiolocation, television, etc. In the narrow part of the tube the cathode K, focussing system and beam-deflecting system are mounted. Deposited on the inner surface of the glass face-plate is a luminescent screen S. The cathode is of the indirectly heated oxide-coated type, it is fabricated in the form of a cylinder with the oxide coating on its end cap. The cathode is mounted inside a control electrode (modulator) CE in which an aperture is provided. The brightness of the spot on the tube screen can be varied by changing the negative potential on the control electrode with respect to the cathode thus changing the electron-beam current.

Moving along the tube axis after passing the control electrode is the electron stream which encounters two anodes A_1 and A_2, both of which are cylindrical in shape. The accelerating field provided by the two anodes ensures the motion of electrons towards the screen and simultaneously focusses the stream into a narrow beam.

Electron beam focussing can be accomplished with the aid of either an electric or magnetic field. In the first case focussing is termed electrostatic and takes place in the electric field between A_1

and A_2. An electron E moving at some angle to the device axis is deflected by the electric field set up between the anodes. Proper selection of the voltage difference on these electrodes ensures focussing of the beam on one spot on the tube screen.

Magnetic beam focussing is achieved by a focussing coil mounted into the tube neck. Deflection of the electron beam is accompanied in the same manner as focussing that is either by an electric field or by a magnetic field. The electrostatic system of beam deflection consists of two pairs of vertical and horizontal deflecting plates. An electron passing between two parallel plates to which a certain voltage is applied, it will be deflected towards the positively charged plate. There being two pairs of mutually normal plates, the electron beam can be deflected in horizontal and vertical planes.

Magnetic field deflection is accomplished by two pairs of deflecting coils mounted into the tube neck at right angles to each other. The greater the magnetic-field intensity H and the lower the voltage V which accelerates the electrons, the greater is the beam deflection. The tube screen is a semitransparent thin layer of a luminous substance.

Most cathode-ray tubes are oscilloscopes used to display rapidly changing voltages and currents.

1. Find in the text synonyms for the following words:

different, to produce, to supply, relative to, at once, to occur, to get, speed, to use.

2. Translate the following expressions. Use them in sentences of your own: with respect to, either ,in the same manner, at right angles, simultaneously.

3. Translate the following terms:

cathode-ray tubes, the focussing system, beam-deflecting systems. Luminescent screens, the control electrode, the electron beam current, the electron stream, the electron beam focussing, the magnetic beam focussing, the magnetic field deflection, the magnetic field intensity, the beam deflection, the horizontal deflecting plates.

4. *Translate into English:*
Электронно-лучевые трубки широко используются в различных отраслях радиотехники. По своей конструкции ЭЛТ состоит из катода (К), системы фокусировки электронного потока и отклоняющей системы. Изменяя отрицательный потенциал управляющего электрода относительно катода, можно регулировать величину электронного потока и таким образом менять яркость светового пятна на экране. Фокусирование электронного потока в узкий луч осуществляется с помощью электрического или магнитного поля.

5. Put questions to the text.

6. Retell the text according to the following plan:
a) The CRT, its construction and application; b) The adjustment of the electron stream; c) Electron stream focussing into a narrow beam; d) Magnetic and electrostatic beam deflection.

7. Explain the principle of a cathode-ray tube operation.
8. Write a summary of the text.

Read the text. Find out the main information of the text.

Переведите в соответствии с контекстом текста:

Десятилетие, несколько, ни одно из наших чувств, несущий сообщение, для того чтобы, вне (за), луч (2 варианта), длина волны, определить, приближение, цель, быстро.

Переведите в соответствии с контекстом текста слова, выделенные курсивом.

RADIO WAVES

During the last few decades, a *subtle* change has occurred which none of our senses can register. Radio waves, bearing messages in many languages, flow ceaselessly around us, through us and above us. We can only hear and see them if we *convert* them to other waves to which our ears and eyes are *receptive*.

Radio waves are the longest members of the family of electromagnetic waves. In the spectrum, in which the waves are *arranged* in order of increasing wavelength, they lie beyond the *infrared waves*. Their wavelengths range from about three hundredths of a centimeter to about 300 kilometers. Radio *broadcasts* today are made by two different methods known as AM (amplitude modulation) and FM (frequency modulation). The frequencies of the waves used are expressed in kilocycles or megacycles. The vibrating current *is fed* into an antenna from which the radio waves are broadcast into space.

Microwaves are the smallest radio waves. In the spectrum of electromagnetic waves they lie between infrared rays and the long radio waves. The shortest microwaves have a wavelength of about three hundredths of a centimeter and a frequency of one million megacycles. The longest microwaves have a wavelength of about three meters and a frequency of one hundred megacycles.

The first microwaves made by man were the two-foot waves produced by Heinrich Hertz. It is interesting that they were the last to be *put to* a practical use. Long waves were easier to produce and send out over long distances. Scientists had to return to the use of short waves in order to solve a problem that *came up* during World War II. The problem was "How can you detect an approaching *enemy* plane while it is still far away?" A possible answer to the problem was to send a beam of radio waves. Long radio waves could not be used for this purpose because they *fan out* too quickly from the broadcasting antenna. Very short waves were necessary to make the radar system work. So new transmitters and receivers were designed to make and use microwaves.

Find answers to the following questions:

1. Can we hear and see radio waves? 2. What place do radio waves occupy in the spectrum of electromagnetic waves? 3. Who produced the first microwaves? 4. Were the microwaves the first to be put to a practical use? 5. What kind of problem came up during World War II?

Form adjectives adding the suffix -ful *to the given nouns. Translate the nouns and adjectives into Russian:*

Example: beauty – beautiful – красота – прекрасный

harm, power, use, fruit, skill, purpose, wonder, care, success, truth hope, taste, respect, meaning, art, change, peace, watch, help.

Form adjectives adding the suffix -less *to the given nouns. Translate the nouns and adjectives into Russian:*

Example: hope – hopeless – надежда – безнадежный

wire, noise, help, motion, friend, aim, shape, branch, cause, character, sense, respect, object, ground, harm, change, power, colour, limit, meaning, voice, weight, life.

Read the words and say what suffixes they have and what parts of speech they belong to:

use, useful, usefulness; invent, inventor, invention; transmit, transmitter, transmission; work, worker; special, speciality, specialist; practice, practical; contain, container; lecture, lecturer; create, creative, creation; accelerate, acceleration, accelerator; determine, determination; proper, properly, property; science, scientific, scientist; discover, discovery, discoverer; important, importance; react, reaction, reactor, reactivity; arrange, arrangement; capable, capability; apply, application.

Make sure if you remember the following verbs. Consult a dictionary:

to send, to cut, to represent, to notice, to sound, to happen, to find out, to consist of, to attach, to turn, to shout, to move, to hear, to store, to release, to repeat, to wear out, to transmit, to reproduce, to follow, to hit, to convert, to fit, to move, to represent, to wind, to claim, to damage, to link.

Define the tense-forms of the verbs in the following sentences. Translate them into Russian:

1. I have just **turned** the radio on. 2. **Have** you **listened** to the news? 3. He **understood** the text after he **had read** it again. 4. **I have read** this book three times. 5. He **has** never **been** to the Carpathians. *6.* He **has seen** this film. 7. **Have** you ever **been** to St. Petersburg? 8. He **had** finished **his** work by 5 o'clock yesterday. 9. The technician **will have recorded** the data before you **come. 10. I have not seen** him since he **graduated** from the University. **11.** We **shall have completed** our experiments by the end of the week. 12. My friend **had prepared** his report before we spoke to you. 13. Electronics **has made** a rapid progress. 14. He **had published** his article by the end of the month. 15. We've **played** lots of matches this season, but we **haven't won** many. 16. She **has spent** a great deal of time in the Far East. 17. They'll **have finished** their work by lunchtime. 18. **Have** you **read** anything interesting lately? 19. They've probably **forgotten** the time. 20. They **have accepted** the scientist's suggestion. 21. Moscow Radio **has been transmitting** its programmes to other countries since the thirties. 22. We **had been conducting** this experiment for two hours before you **came.** 23. When she **arrived, I had been waiting** for two and a half hours. 24. It **has been raining** since two o'clock.

Translate the following sentences into Russian paying attention to the predicates in the Perfect Passive:

1. This theory **has been used** for analyzing the experimental data. 2. In my opinion this result **has not been proved** by anybody. 3. The apparatus used in our research **has been described** recently. 4. We must compare our data with **those** that **have been obtained** by other investigators. 5. Many difficulties **had been overcome** before the researcher succeeded in his work. 6. After the new device **had been tested** it was installed in our laboratory. 7. The construction of this television centre **will have been completed** by the end of the next year. 8. In our country great progress **has been achieved** in developing all branches of science and engineering. 9. Many different devices **have been created** in order to improve the performance of communications. 10. The information **has been based** on the data received from a computer. 11. Much research **has been carried out** in order to establish the causes of this phenomenon. 12. This question

has already **been discussed** at the conference. 13. By the end of the year a large variety of semiconductor devices **will have been produced.** 14. This equipment **had been repaired** before you came. 15. This text **has** just **been translated.** 16. Mendeleyev's periodic law **has been accepted** as a universal law of nature.

Translate the following word-groups into Russian, pay attention to the tense-forms of the verbs:

the scientist has suggested; the motion had been caused; the theory has advanced; the methods have been developed; he has been developing; the progress has been made; the suggestion has been applied; the observation has shown; the problem has been solved; the error will have been determined; the point of view has influenced; the chemist has written; the number has exceeded; the energy had been converted; the radio has been transmitting.

Compare the use of the Past Indefinite and the Present Perfect in the following sentences, translate them into Russian:

1. I have written several letters today. I wrote several letters yesterday. 2. They have made a new experiment this week. They made a new experiment last week. 3. She has been to the theatre this month. She went to the theatre last month. 4. Have you ever been to London? Yes, I've been there once. I went there in 1998. 5. Have you ever seen "Hamlet"? Yes, I've seen "Hamlet" several times. I saw it at our theatre three years ago and at Moscow theatres in 1995 and 2000. 6. He has graduated from the Moscow University. He graduated from the Moscow University in 1988. 7. He has seen this film. He saw this film yesterday. 8. He has improved his device; you may use it. He improved his device a week ago. 9. He prepared his report ahead of time. Have you prepared your report? 10. The results of this research were published long ago. My friend has already published the results of his discovery.

Define the functions of the verb to have *in the following sentences. Translate them:*

1. They **have** already **passed** the examination in electrical engineering. 2. Automated systems **have** a number of advantages. 3. Our district **has** now **been transformed** into a big

construction site. 4. Gamma rays **have** no electric charge. 5. Cosmic television **has** a great future. 6. He **had to work** hard to complete his investigation in time. 7. The engineer **will have to improve** the accuracy of this machine-tool. 8. A new method **has been used** in order to investigate this problem. 9. I **have to do** this work now. 10. We **had to repeat** the experiment. 11. Our planet **has** powerful sources of energy. 12. You **will have to go** to the library to get this book. 13. **I had to leave** early because I didn't feel well. 14. We've **got** a new teacher. 15. She **has** a lot of character and energy. 16. Yesterday I **had** a bad headache. 17. She **will have** many new subjects next term. 18. The scientist **had to stop** the experiment. 19. Besides literature, we **have to study** history and philosophy. 20. The electron **has** almost the same mass as the proton.

Match up the words which are opposite in meaning:

to stop, frequently, high, charge, to start, important, first, part, common, rarely, low, complicated, discharge, the whole, quick, transmitter, to heat, unimportant, increase, receiver, to cool, light, decrease, simple, heavy, to begin, slow, special, last, to finish.

Read the text. Find out the main information of the text.

Переведите в соответствии с контекстом текста:

запись, вручную (рукописный), игла, замечать, создавать шум, звучать, беседа, истинный, голос, выяснять что-то, происходить, решать, человеческий, необычный, поэтому.

Переведите в соответствии с контекстом текста слова, выделенные курсивом.

THE RECORD-PLAYER. HOW DOES IT WORK?

You may know a lot about music: you may have a good knowledge of modern records: but how much do you know about the machine that plays your records? How, for example, does it work? It will help you to understand how record-players work, if you go back

to the person who *invented* the first phonograph, Thomas Edison.

He had been experimenting on ways of sending Morse Code[1] signal more quickly by telegraph: in order to do this, he built a machine which *cut out* small marks, representing the Morse symbols, into a strip of paper. By running the paper[2] through the transmitting machine at a very fast speed, he could send messages much more quickly than by the manual method. He noticed that the machine was making a noise which sounded like human voices[3] in conversation. Edison was a true scientist: if something unusual happened he wanted to find out why: so he decided to fit a diaphragm to the machine, to see what this would do.

After a few experiments, Edison devised a machine which consisted of two diaphragms on either side[4] of a *drum* of *tinfoil*. Each diaphragm was attached to a needle, which rested on the foil. Edison turned the drum by hand and shouted a poem into one of the diaphragms – the recording unit – which then cut a pattern into the tinfoil. This is because the diaphragm vibrations moved the needle in certain directions, which were recorded on the foil.

Edison then reversed the process so that the reproducing needle was at the start of the newly-cut needle path[5] and started *winding* the drum again. He then heard his own voice repeating the poem: the needle, following the path in the foil, vibrated its diaphragm which then reproduced the sounds that the other diaphragm had recorded.

This all happened in 1877, more or less *by accident*. In a hundred years of development and experimentation, the phonograph has developed into what we know now as the record-player. The principle is still *the same*, however, sound waves hitting a microphone (diaphragm) are then converted onto a record by mechanical or electronic means. The sound is then stored, it is *released* as vibration when the needle follows the path that has been cut, and reproduces the original message. Stereo sound is a little more complicated. Two microphones, each *attached* to its own recording systems, record the sound that is produced from the *loudspeakers*. It *appears* very similar to the original sound. Nowadays, by "mixing" the sound, and by

changing it from one channel to the other, you can make the sound travel from one loudspeaker to the next one.

Notes

1. Morse Code – азбука Морзе
2. by running the paper – посредством пропускания бумаги
3. like human voices – подобно человеческим голосам
4. on either side – с обеих сторон
5. the newly-cut needle path – только что прорезанная дорожка

Say whether the following statements are true or false:

1. Edison had been experimenting on ways of sending Morse Code signals more quickly. 2. The machine was making a noise which sounded like human voices in conversation. 3. Edison turned the drum by hand but couldn't shout a poem into the diaphragm. 4. The diaphragm vibrations moved the needle in certain directions. 5. The work of the modern record-player is based on other principles. 6. One can make the sound travel from one loudspeaker to the next one.

Translate the last paragraph.

Переведите в соответствии с контекстом текста:

Позволить, выдвинуть (теорию), просто, длина, ослабить контакт, предложить, измерять, подтвердить, оборудование, применение, удобство, сквозь (через), связанный,

Переведите в соответствии с контекстом текста слова, выделенные курсивом.

THE STORY OF RADIO

Without understanding the inquiries of pure science[1], we cannot follow the story of radio. It begins perhaps with Joseph Henry, an American physicist, who discovered in 1842 that electrical *discharges* were oscillating. A gigantic step forward was taken by James Maxwell, a Scottish physicist and one of the great mathematical geniuses of the 19-th century. By purely mathematical reasoning[2], Maxwell showed that all electrical and magnetic phenomena could be reduced to stresses and motions in a medium, which he called the *ether*. Today we know that this "electrical medium" does not exist in reality[3]. Yet the concept of an ether helped greatly, and allowed Maxwell to put forward his theory that the *velocity* of electric waves in air should be equal to that of the velocity of light waves, both being the same kind of waves[4], merely differing in wave length.

In 1878, David Hughes, an American physicist, made another important discovery in the pre-history of radio and its *essential* components. He found that a loose contact in a circuit containing a battery and a telephone *receiver* (invented by Bell in 1876) would *give rise* to sounds in the receiver.

In 1883, George Fitzgerald, an Irish physicist, suggested a method by which electromagnetic waves might be produced by the discharge of a condenser. Next we must turn to Heinrich Hertz, the famous German physicist, who was the first to create, *detect* and measure electromagnetic waves, and thereby experimentally confirmed Maxwell's theory of "ether" waves. In his experiments he showed that these waves were *capable* of reflection, refraction, polarization, diffraction and interference.

A.S.Popov (1859-1906) was in 1895 a lecturer in physics. He set up a receiver in 1895, and read a paper about it at the Meeting of the Russian Physico-Chemical Society on April 25 (May 7, New Style) 1895. He demonstrated the world's first radio receiver, which he called "an apparatus for the detection and registration of electric oscillations". By means of this equipment, Popov could[1] register electrical disturbances, including atmospheric ones. In March 1896 he

gave a further demonstration before *the sam*e society. At that meeting the words "Heinrich Hertz" were transmitted by wireless telegraphy in Morse code and *similarly* received before a distinguished scientific audience[5]. Popov became the *inventor* of the radio, May 7 being celebrated each year as "Radio Day" in many countries.

Marconi invented a system of highly successful wireless telegraphy, and inspired and supervised its application.

Such is the story of the many inventors of wireless telegraphy, working with each other's equipment, adding new ideas and new *improvements* to them. It was a patient, persistent inquiry into natural laws and it was animated by the love of knowledge[6].

During the first years of its development, radio *communication* was called "wireless telegraph and telephone". This name was too long for convenience and was later changed to "radio" which comes from the well-known Latin word "radius" – a straight line drawn from the centre of a circle to a point on its *circumference*. Wireless transmission was named radio transmission, or simply "radio".

The term "radio" now means the radiation of waves by transmitting stations, their propagation through space, and *reception* by receiving stations. The radio technique has become closely associated with many other branches of science and *engineering* and it is now difficult to limit the word "radio" to any simple definition.

Notes

1. without understanding the inquiries of pure science – не зная истоков чистой науки
2. by purely mathematical reasoning – при помощи чисто математических рассуждений
3. does not exist in reality – на самом деле не существует
4. both being the same kind of waves – причём обе являются волнами одного типа
5. distinguished audience – авторитетная аудитория (публика)
6. be animated by the love of knowledge – быть движимым тягой к знаниям

Say whether the following statements are true or false:

1. H. Hertz was the first to create electromagnetic waves.

2. A.S. Popov could not register atmospheric disturbances. 3. A.S. Popov is the inventor of the radio. 4. The words "Heinrich Hertz" were transmitted by wireless telegraphy in Morse code.

Answer the following questions on paragraph I:

1. Who discovered the oscillation of electrical discharges? 2. Does "the ether" exist in reality? 3. What did the concept of an ether help Maxwell in?

Translate paragraph 5-6 into Russian.

Список литературы

1 Английский язык для студентов радиотехнических специальностей вузов:/ Е.П.Тарасова, Т.Г. Шелягова, В.П. Киселева и др. - Мн.: БГУИР, 2006.− 213 с.

2 Голузина В.В., Петров В.С. Пособие по английскому языку для электротехнических и радио технических вузов. Современная электроника и электронные приборы. / В.В. Голузина., В.С. Петров. Учеб. пособие.— М.: Высш. школа, 1974. - 153 с.

3 Учебник английского языка для технических университетов и вузов: учебник для вузов. / И.В. Орловская, Л.С. Самсонова, А.И. Скубриева. – 14-е изд., – М: Изд -во МГТУ имени Н.Э. Баумана, 2015 – 447 с.

4 Федеральный государственный образовательный стандарт среднего профессионального образования по специальности 11.02.01 Радиоаппаратостроение. Утверждён приказом Министерства образования и науки Российской Федерации от 14.05.2014г. № 521.

5 www.articlesbase.com/internet-articles

МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ

для практических занятий и самостоятельной работы студентов по дисциплине «Иностранный язык» для студентов 4 курса специальности 11.02.01 Радиоаппаратостроение

Составитель
Полухина Ирина Васильевна

В авторской редакции

Компьютерный набор И.В. Полухиной

Подписано к изданию 21.04.2017
Уч.- изд. л. 1,7

ФГБОУ ВО «Воронежский государственный технический университет»
394026 Воронеж, Московский просп., 14