

## Вступление

Методические указания «Моя специальность» предназначены для студентов II – III курсов факультета автоматизации и приборостроения, которые обучаются по специальности «Радиофизика и электроника». Целью методических указаний является развитие разговорных навыков, чтение оригинальной литературы, аннотирование текстов по специальности на английском языке.

Эти методические указания можно рассматривать как дополнительный материал к главному курсу английского языка, который изучается студентами. Они составлены на базе знаний по программе английского языка для технических вузов.

«Моя специальность» – это одна из самых важных тем, которую изучают студенты. Материал методических указаний содержит ряд текстов, заданий, упражнений, которые направлены на подготовку студентов к восприятию текстов по специальности на английском языке.

**Прочтите текст и определите, в каких областях науки и техники электроника нашла широкое применение. Выпишите из текста упомянутые направления использования электроники.**

### WHAT IS ELECTRONICS?

Electronics is a rather young science. It belongs to the twentieth century. Within a short period it has become a powerful means of progress.

Electronics surrounds us everywhere. Television, radio-receiving, tape-recording – are all based on electronics. The ideas of electronics are embodied in computer technology and means of automation, biology and genetics which have advanced biotechnology as a new branch of the national economy.

Electronic computers are widely used in scientific research and different fields of industry. Very complicated electronic systems control the work of huge plants and power stations; even whole industries are controlled by electronic robots. Planes and rockets also electronically controlled.

Electronics has sharpened our vision and chance to see the microworld more clearly. It helps us discover new and puzzling phenomena of nature.

Due to electronics the first man-made sputnik was launched into space, and now man has already set his foot on the Moon, sends probes to distant planets. Radioelectronic systems ensure reliable communication with space probes at distances of millions of kilometers, relay telephotos of distant planets. The greatest application of electronics is in the field of communications.

The range of radio communication in space is extending more and more. There is every reason to believe<sup>1</sup> that radio links may be set over distances of 100 million kilometers or even more.

Now we cannot imagine our life without electronics.

But it all began with the invention of radio. It was Russian scientist A.S. Popov who discovered the principles of wireless communication that finally led to the development of electronic tubes for use in various communication devices.

1- There is every reason to believe – Есть все основания полагать

## DO YOU KNOW THAT...

*In 1900 at the First All-Russian Electrotechnical Congress the great Russian scientist Popov said: "Was my instrument known to Marconi or not? The latter is very likely more probable. At any rate my combination of the relay, tube and electromagnet tapper served as the basis of Marconi's first patent as a new combination of already known instruments."*

**Просмотрите текст и выпишите слова, относящиеся к вашей специальности**

### FUTURE SPACE TRAFFIC

By the end of the 20<sup>th</sup> century there were certainly more than 10,000 earth, lunar and other planetary satellites. Many will be for research, many for communication purposes, their sizes being different, from a few feet to thousands of feet in diameter. Most are automatic, unmanned ones, others are manned. Orbiting observatories will be "stationed" 22,238 miles above the equator. Seen from the Earth, they will seem stationary as they travel at about 6,882 miles per hour, which compares to the surface speed of 1,000 miles an hour at which the Earth revolves. Equipped with light amplifiers three such observatories, spaced at equal distances over the equator, can directly view and photograph any part of any country (except the polar regions) and locate any intercontinental missiles when launched, cloud formation and cyclones. All space observatories are expected to be equipped with most modern and sensitive infrared receiving equipment. Even with present-day equipment, they are able to detect a multitude of heat effects at a distance of 22,238 miles overhead. Also connected by cable to every orbiting observatory will be a huge aluminized plastic ball or sphere from 750 to 1,000 feet in diameter. The three (observatories, stationed at equal distances around the Earth 22,238 [miles over the equator will reflect from their spheres all electronic, long-distance, national and international communication signals, be it radio, TV, telegraph or telephone, or other signals.

**Просмотрите текст и выпишите ключевые слова, соответствующие основным этапам освоения космоса человеком.**

### OUTER SPACE: A ROAD WITHOUT END

Space exploration is one of the most exciting chapters in human history. It was opened by Yuri Gagarin, citizen of the USSR, who made the first-ever orbital flight on April 12, 1961.

More 50 years have passed. No Sphere of science and technology has developed as rapidly as cosmonautics. It has attained today much of that which seemed fantasy but a short time ago. Among these achievements have been man's exit into open space, the launching of multi-seat space vehicles and the approach and docking of these craft in space, the creation of long-term orbital scientific research laboratories, the development of space technology, and the execution of space expeditions lasting for many months. Researchers and explorers have attained access to the Moon. Interplanetary stations have collected a wide range of information about Venus, Mars, and other planets in the solar system.

**Переведите предложения (обратите внимание на формы страдательного залога).**

Sonar (Sound Navigation and Ranging) is employed to locate submerged<sup>1</sup> enemy submarines. Like radar it is an echo-ranging device. It operates in the following way – a ship sends a sound wave into the water. Encounting an obstacle<sup>2</sup> the wave is reflected back to the ship, which – since<sup>3</sup> the speed of sound through water is known – determines its distance from the object from the time it took the echo to return.<sup>4</sup> To create the original sound wave, the ship generates electrical signals in a transmitter; it then sends these to a transducer, positioned on its keel as deeply in the water as possible. The transducer converts the signals into sound and transmits them through the water.

1 – submerged – погруженный

2 – Encounting an obstacle – Сталкиваясь с препятствием

3 – since – поскольку

4 – the time it took the echo to return – время, которое требуется, чтобы эхо вернулось.

## MY FUTURE PROFESSION

Nowadays the progress of engineering and science cannot be imagined without automation. We live in this age.

I am a student of the National Technical University “Kharkiv Polytechnic Institute” and study at the Automatic equipment and device making department. The students of our department specialize in automated control systems, industrial electronics and equipment, metrology, measuring systems and biomedical systems and equipment.

To become qualified engineers we study the fundamentals of modern knowledge, the achievements of the science and technology at the University.

My future profession is named “Radio physics and electronics”.

Today, radio or more widely electronics, a very young and a very promising science, has become a powerful tool of progress. It will give us a deeper knowledge of the properties of outer space. Radio is not the only carrier of information in space. But infra-red and ultra-violet radiation, X- and gamma-rays, elementary particles, etc.

I chose it because I like to work with the electronic equipment and repair it.

As future engineers we have to know physics, mathematics, technical drawing and other.

We also study some special subjects: electrical engineering, automation and automated control systems, computing and subjects that are touched on our speciality.

A highly qualified staff of professors and teachers trains us. Our practical training and laboratory works are done in the well-equipped laboratories with modern apparatus and devices. Theoretical training is combined with practical one and help to teach a highly skilled engineer, ready for independent work.

I want to be an electronic engineer to earn money for my family and I'd like to study open space with its planets, stars, black holes to make contribution to this field of science.

I like my future profession.

Universe	Вселенная
Space	Космос
Measurement	Измерение
Observe	Наблюдать
Depth	Глубина
Electronics	(радио) Электроника
Electronic	Электронный
Integrated circuit	Интегральная схема
Sensitive	Чувствительный
Detection	Обнаружение

### *DO YOU KNOW THAT ...*

#### *Why is the Moon Two-Faced?*

*Photos of the far side of the Moon show it to be different from the side we see – it has many more peaks and fewer “seas.” Recently astronomers concluded that this asymmetry may well have resulted<sup>1</sup> from internal causes rather than from external influences. One of the causes may have been the rapid deceleration of the Moon’s rotation reducing the centrifugal force, which, in turn, changed the balance between the two sides.*

*1 - may well have resulted - вероятно явились результатом*

### **RADIO ELECTRONICS**

The formula – radio + electronics = radio electronics – provides us with a good example of fruitful cooperation. Use is made of radio electronics at every step. High frequency currents are successfully used in medicine, fast acting computers in mathematics. Radiotelescopes are used by astronomers, accelerators of charged particles by physicists, electronic musical instruments by musicians. Without radio electronics we would not have cybernetics, astronautics and nuclear physics. We know radio electronics to surround us everywhere.

We believe much attention to be now paid to the frequency stability of generators. Scientists consider the frequency stability of generators to be the heart of all radio transmitting systems.

It has been established that for reliable contact with Mars, the control of frequency should be within billionths of a per cent.

The part of “electrical pendulum” which sets the frequency of oscillations in highly stable generators is played by a plate of crystalline quartz. Like the string of a musical instrument, this plate can be tuned to a definite frequency. The thinner the plate, the higher the frequency. The thinnest plates give a frequency of scores of mops (millions of oscillations per second).

The superhigh frequencies used in cosmic communication are of hundreds and thousands of mops. Application is made of special multipliers of oscillations to achieve such frequencies. Ordinarily it is a chain of valve or transistor stages, each incorporating a score of parts. This increases necessarily the size of equipment, requires more power and results in reduced reliability.

### **Exercises**

I. Translate these sentences, paying attention to the Objective with the Infinitive:

1. We want our students to read as many books as possible. 2. We believe them to master English in the shortest time possible. 3. We know optoelectronics to hold out great promise. 4. The students did not notice the professor leave the lecture hall. 5. We hold transistors to be used on a great scale in the nearest future. 6. Scientists consider transistors to revolutionize radioengineering and electronics.

II. Напишите аннотацию к тексту.

#### *DO YOU KNOW THAT ...*

*The cosmonauts who will travel to Mars can count on being away from home<sup>1</sup> to two or three years. Therefore a prime worry is the health of humans subjected to years in space. Weightlessness takes a gradual toll including atrophy<sup>2</sup> of the heart and muscles. Crew members would probably have to wear elastic spacesuits<sup>3</sup> forcing the muscles to work continuously.*

*I - can count on being away from home - могут рассчитывать на то, что будут находиться вне дома*

2 - *weightlessness takes a gradual toll including atrophy* - невесомость постепенно приводит к потерям, включая атрофию (истощение)

3 - *elastic spacesuits* - упругие костюмы

**Прочтите текст и выпишите ключевые слова и словосочетания, которые помогут вам ответить на вопрос, поставленный в заголовке текста. Напишите аннотацию к тексту.**

### WHY SPACE EXPLORATION?

A thousand threads<sup>1</sup> connect the Earth with the processes in outer space. The Sun is a source of radiations which affect the Earth, as do many other extra-terrestrial factors.<sup>2</sup> So without taking space processes into account an understanding of what seem to be strictly terrestrial phenomena, of their real causes and essence,<sup>3</sup> is impossible.

Space is an enormous natural laboratory where we can observe and study new phenomena, discover new laws of nature and then apply that knowledge to practical problems back here on Earth.

Information about other similar bodies of common origin and appearance in the solar system can be used to study the laws governing<sup>4</sup> the structure and evolution of the Earth. The study of the atmospheres of other planets gives us a profound insight into<sup>5</sup> the Earth's atmosphere and climate.

The first steps in using space vehicles to study the planets of the solar system have brought us as much information as had been accumulated over many previous decades.<sup>6</sup>

We have received a lot of experimental material from artificial earth satellites and automatic probes which provided the key to understanding many phenomena in the ionosphere and the Earth's magnetic field, and to understanding other physical processes in both near-Earth and interplanetary space.

The inter-state exchange of meteorological information collected by satellites will help make long-term weather forecasting<sup>7</sup> more accurate.

Space technology has considerably improved communications and television equipment. Merchant ships and civil planes<sup>8</sup> widely use the navigational satellite systems. Exploring the Earth's natural resources from artificial earth satellites and orbital stations is becoming extremely



important. It is no longer a flight of fancy to talk about orbiting entire production laboratories.

Looking a little bit further into the future, we can't rule out<sup>9</sup> the possibility of people settling on the nearest celestial bodies. In the early stages mining<sup>10</sup> and processing the minerals for space structures will be the main occupation.

1. a thousand threads — тысяча нитей

2. extra-terrestrial factors — межпланетные факторы

3. an understanding of what seem to be strictly terrestrial phenomena, of their real causes and essence — понимание того, что кажется только земными явлениями, понимание их действительных причин и сущности

4. the laws governing — законы, определяющие

5. a profound insight into — глубинное проникновение в

6. previous decades — предшествующие десятилетия

7. long-term weather forecasting — долгосрочный прогноз погоды

8. merchant ships and civil planes — торговые корабли и гражданские самолеты

9. we can't rule out — мы не можем исключить

10. mining — горнодобыча

## Exercises

I. Заполните пропуски в соответствии с содержанием текста; предложения переведите:

1. The Sun is ... .. of radiations. 2. Space is ... .. where we can study new phenomena. 3. We can discover new ... .. and then apply that knowledge to practical problems. 4. We can understand many ... in the ionosphere and the Earth's magnetic ... . 5. ... the Earth's natural ... is becoming extremely important.

II. Найдите в тексте предложения с формами Perfect Tense и переведите их.

## EXERCISES

### *I. Переведите без словаря*

#### IT LETS YOU LISTEN TO AND RECORD SOUNDS YOU'VE NEVER HEARD BEFORE

The average microphone picks up sounds from only a few feet away. But with a parabolic reflector around it you have a highly sensitive listening device for recording distant sounds, such as from unseen birds and animals far away. The reflector focusses sound waves to a central point thus magnifying them as much as 12 times. Human voices and wildlife sounds can be picked up at distances of 75 feet or more.

### *II. Переведите отрывок из технической документации*

#### PORTABLE ULTRASHORTWAVE RADIO-UNIT. TYPE "27PL"

The "27Pl" radio-unit is a portable, telephone, transmitting and receiving station, consisting of a heterodyne receiver and frequency-modulation transmitter.

Sensitivity of the receiver is not below 1.5  $\mu$ v at a signal-to-noise ratio of 10 to 1 (20 db). The transmitter has a power of 0.5 watt. The radio-unit has two channels within the frequency range from 148 MC to 174 MC and spaced 150 KC from one another.

Supply for the radio set is provided by two-storage batteries, each one of 1.5 volts.

The unit consumes not more than 1 a in receiving and 2.5 a in transmitting.

The communication distance is as large as 3 km in operation with a radio-unit of the same type and from 5 to 8 km in operation with a mobile station of the type "28Pl".

### *III. Переведите следующие словосочетания с предлогом of:*

a powerful means of progress, the ideas of electronics, means of automation, to control the work of plants and power stations, phenomena of nature, applications of electronics, the field of communication, the invention of radio, the principles of wireless communication.

*IV. Translate the following word combinations:*

1. radio signal, radio valve, radio receivers, radio waves, radio electronics, wave length, signal feed, quantum electronics, quantum generators, quantum amplifiers, semiconductor laser, ruby crystals, maximum efficiency, power efficiency, power generation, maximum sensitivity, semiconductor devices, communication techniques;

2. light and radio waves, long distance communication, semiconductor quantum generators, space radio navigation, space radio communication, light wave energy, miniature radio stations, optic quantum generators, high frequency radiation, super speed computers, luminescent crystal lasers, quantum light intensification, accidental current oscillation; transmission band frequency;

3. radio frequency quantum generators, the centimetre and decimetre wave radio receivers.

### THIRD EYE FOR SPACE EXPLORERS

An astronaut landing on the moon may need an eye fin the back of his head and a new “Electocular” headset may well provide it.

The headset contains a miniature cathode-ray tube to receive a closed-circuit TV picture, as well as an internal mirror to “bend” the image toward the viewing eyepiece. A microphone for voice communications is also provided. Since the monocle type eyepiece is a transparent mirror, the wearer can look through the image, when necessary, to concentrate on what is actually in front of him. The apparent size of the image (up to 8 feet in diameter) varies according to where he focuses his eyes. Many other applications are expected for the new device — it's being used toy the pilot, for example, to receive pictured information from the control tower on air traffic and ground conditions.

#### Explanatory Notes

internal — inside

to bend —to reflect

eyepiece — eyeglass

*V. Translate these word combinations:*

to cause motion, to cause rotation, the cause of disaster, the cause of peace, the cause of explosion; to investigate various phenomena, the investigation of

some technical process; the way to the station; the way of making experiments, in just that way, in some way, in the same way; the most spectacular event, the most spectacular phenomenon, the most spectacular findings; the same reason, some reason; the same component, some component; the same changes, some changes; the same kind of explanation, some kind of explanation; some 20 miles; at a height of six kilometres, at a height of twenty kilometres; at a speed of 120 kilometres, at a speed of 200 kilometres; to complete an experiment, to depend completely, to reveal completely, a complete change from the point of view; from my point of view, from this foreign scientist's point of view.

*VI. Translate the following international words:*

distance, construction, resources, atom, planet, orbit, radio, electricity, electronics, plasma, program, proton, electron, atmosphere, central automation, machine, function, system, automatic.

*VII. Translate into Russian or Ukrainian*

Plasma from Air

The Institute of Electric Welding named after E. Paton in Kiev has developed a tool for cutting sheet steel, using instead of the conventional gas burner an air-fed plasmatron. A jet of air plasma cuts 50-70 mm sheets of steel, non-ferrous metals and alloys. It cuts in one third to one quarter the time it takes a gas-oxygen burner to do it.

*Pronounce these words:* meteorite ['mi:tjərait]; crater ['kreitə]

*VIII. Read and retell*

Laser Measures Arctic Ice

A laser installed on a plane flying in the North Pole area made it possible to measure the thickness and the configuration of the ice-floes there. Previously radar was used and sometimes produced inaccurate results. Experts believe radar to be replaced by laser which will make navigation in the Arctic Ocean safer and more reliable.

### *IX. Translate into mother tongue*

#### Phaser

The first letters in the word phaser indicate that the principal peculiarity of this device is phonons-quanta of the crystal-lattice<sup>1</sup> oscillations.

In strong electric fields in the crystals of some semiconductor and semi-metallic substances conduction electrons can cause the creation of phonons — to induce sound.

Given definite conditions there occurs a sudden strengthening of phonon emission. It occurs at the rate<sup>2</sup> considerably exceeding the usual one. Thus a coherent stream of phonons is being created. This effect discovered by American scientists in 1962 lasts only a million of a fraction of a second.

Moreover the emission of coherent sound is accompanied by the generation of a tremendous amount of heat, which results in destroying the crystal.

Polish scientists have succeeded in eliminating the influence of this heat effect and as a result of their research an electron-phonon accelerator has appeared. In this device the emitter is cadmium selenide and cadmium sulphide.

The creation of a new physical device is very promising because of its wide application in electronics, radar digital computers, etc.

1. lattice — решетка

2. rate — *зд.* темп

#### *Answer these questions:*

1. What is the principal peculiarity of a phaser? 2. How can electrons cause the creation of phonons? 3. In what conditions does a sudden strengthening of phonon emission occur? 4. In what country has an electron-phonon accelerator appeared? 5. Where will the phaser find wide application?

### *X. Translate the following sentences and explain the use of tenses in them:*

1. Our laboratory contains a sensitive electroscope, a device which can detect electric charge. 2. The electrode will develop an equilibrium potential. 3. In the earlier experiment with our simple cell, when the galvanometer was connected between its terminals, it should have been noticed that, as hydrogen bubbles collected around the copper electrode, the initial value of the current fell to a much smaller value. 4. The Daniell cell is a modified form of the simple cell we have

already studied. 5. The container made of copper acts as the anode. 6. Cells which can be charged as well as discharged are called secondary cells. 7. Accumulators have the advantages not only of long life, but they show little polarization and have low internal resistance.

*XI. В предложениях опущено одно слово. Лишь один из трех предложенных вариантов грамматически правильно оформит предложение.*

1. Scanning ... by deflecting an electron stream periodically in two perpendicular directions.

a. produced; b. to be produced; c is produced

2. All other frequencies down to the picture frequency ... for general image reproduction.

a. required; b. will be required; c requiring

3. All the systems ... employ a scanning pattern which is independent of the contents of the picture transmitted.

a. discussing; b. discuss; c discussed

4. The form of scanning which ... as most satisfactory for television is one in which the spots move in a series of straight parallel lines covering the picture area.

a. having been accepted; b. to have been accepted; c has been accepted

5. The signal ... by the antenna is conveyed to the radio receiver by some balanced line.

a. is received; b. receives; c received

6. The signal ... over the communication channel to a picture-reproducing spot whose brightness is controlled by the information supplied by the signal.

a. is transmitted; b. being transmitted; c to be transmitted

*XII. Лишь одна из четырех предложенных грамматических форм слова правильно оформит предложение.*

1. The useful range of ultra-high-frequency transmission (определяется) by the horizon.

a. determines; b. is determined; c determined; d. to be determined

2. The modulated radio frequency carrier (передается) to the transmitting antenna, from which it is radiated.

a. was fed; b. is fed; c. feeding; d. feeds

3. The service area of any one transmitter (ограничивается) to a radius of 25 to 50 miles for practical transmitting antenna heights.

a. is limited; b. limited; c are limited; d. is to limit

4. The signal received by the antenna (передается) to the radio receiver by some form of balanced line.

a conveyed; b. was conveyed; c was to convey; d. is conveyed

5. The radio frequency output of the first stage (смешивается) with the output of the local oscillator.

a. is to be mixed; b. is mixed; c mixes; d. will be mixed

6. The level of the video signal (необходимо усилить) several stages of video amplification before it can be used.

a. is amplified; b. was to be amplified; c must be amplified; d. to be amplified

*XIII. Сгруппируйте эквиваленты из двух столбцов:*

radio and electron devices	полупериодный выпрямитель
rectifier	посредством
input current	полупериод
half-wave rectifier	импульсный ток
by means of	входной ток
half cycle	радио- и электронные приборы
pulsating current	выпрямитель

*XIV. Продумайте ответы на следующие вопросы.*

1. What is the main difference between the a.m. detector and the half-wave rectifier? 2. What frequency does the half-wave rectifier work at? 3. What kind of voltage is required to reduce the gain of a valve amplifier and why? 4. What filters can separate a.g.c. voltage from the audio output? 5. How is a diode included into a.m. detector circuits? 6. What are the output frequencies of a detector and what are the levels of these frequencies? 7. Will anything happen if the detector circuit is used without the capacitance  $C_1$ ? 8. What input frequency is utilized in the a.m. detector and why? 9. What is the signal level of i.f. coming to the a.m. detector input? 10. What happens if we do not use the diode in the a.m. detector? 11. What is the role of a detector in a.m. and f.m. receiver?

## TESTS

*Choose the correct English equivalent:*

1. Частота колебаний
  - a) definite frequency
  - b) high frequency currents
  - c) the frequency of oscillations
2. Так называемый метод используется в этом случае
  - a) use is made of the so-called method in that case
  - b) mention is made by the so-called method in that case
  - c) application should be made of the so-called method in that case
3. Играть роль
  - a) to play a part
  - b) to pay attention to
  - c) to give attention to
4. Радиопередающие устройства
  - a) radio transmitting devices
  - b) radio receiving devices
  - c) radio frequency currents
5. Анод
  - a) a plate
  - b) a valve
  - c) a bulb
6. Следует упомянуть
  - a) use should be made
  - b) mention should be made
  - c) application should be made
7. Приводить к
  - a) to result from
  - b) to result in
  - c) to refer to
8. Настроить на определенную частоту
  - a) to use high frequency
  - b) to set the frequency
  - c) to tune to a definite frequency of oscillations
9. Потреблять энергию
  - a) to consume energy
  - b) to produce energy
  - c) to require energy



*Choose the right word or word combination and fill in the blanks:*

1. Radiotelescopes ... by astronomers.

a) to use; b) for using; c) be used; d) are used.

2. Without radio electronics ... cybernetics, astronautics and nuclear physics.

a) would not have; b) to have; c) having; d) has.

3. For reliable contact with Mars the control of frequency ... within billionths of a per cent.

a) is; b) should be; c) has; d) ought.

4. There ... special multipliers of oscillations to achieve superhigh frequencies.

a) was; b) have; c) are; d) has.

5. The movement of the signal beyond the permissible band of transmission frequency ... disrupt normal operation of the instrument.

a) has; b) was; c) would.

6. The superhigh frequencies ... in cosmic communication are of hundreds and thousands of mops.

a) used; b) having used; c) using.

<i>Test 1</i>	1	2	3	4	5	6	7	8	9
	<i>c</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>b</i>	<i>b</i>	<i>c</i>	<i>a</i>
<i>Test 2</i>	1	2	3	4	5	6			
	<i>d</i>	<i>a</i>	<i>a</i>	<i>c</i>	<i>b</i>	<i>a</i>			

**A**

**Access** доступ (к памяти ПК)  
**Adjust** регулировать, настраивать  
**Amplify** усиливать  
**Amplitude** радиус действия, широта  
**Average** выражаться в среднем

**B**

**Band** полоса частот  
**Behavior** режим (работы)  
**Bulk** объем; объемный

**C**

**Capacity** емкость;  
 производительность  
**Cause** причинять, вызывать  
**Celestial** звездный, небесный  
**Character** знак, символ  
**Charge** заряд  
**Circuit** цепь, схема  
**Coil** катушка  
**Component** блок, узел  
**Conduct** проводить  
**Control** управлять, настраивать  
**Convert** преобразовывать

**D**

**Data** данные  
**Deal** иметь дело с  
**Delicately** чувствительно; тонко  
**Device** прибор, устройство  
**Dimension** размер, величина

**E**

**Emit** излучать  
**Engineering** техника  
**Eventually** в конечном счёте

**F**

**Feature** характерная особенность  
**Feed** подавать, питать  
**Fixed** стационарный  
**Fluctuation** колебание, отклонение  
**Frequency** частота

**G**

**Gain** получать, достигать  
**Galaxy** Галактика

**H**

**Handle** обращаться, пропускать

**I**

**Induce** индуцировать  
**Instrument** прибор, аппарат  
**Intermediate** промежуточный  
**In terms of** в виде; в единицах

**J**

**Jamming** (радиофиз.) помехи

**K**

**Keep up ( down )**  
 поддерживать(подавлять)

**L**

**Large-scale** большой масштаб  
**Launch** запускать (ракету)

## M

**Machinery** машинное оборудование  
**Macrocosm** вселенная  
**Maintain** обслуживать, содержать  
**Man-made** искусственный  
**Maser** мазер (квантово-механический генератор оптического диапазона)  
**Measure** измерять  
**Mode** режим (работы)  
**Mount** монтировать, устанавливать

## N

**Noise** шум, помехи

## O

**Original** исходный, первоначальный

## P

**Phase** период, ступень  
**Phenomenon** явление  
**Plate** пластина, анод  
**Polarity** полярность  
**Power** энергия, мощность  
**Precise** точный

## R

**Range** сфера, диапазон  
**Register** счётчик  
**Run** вращаться, работать(о машине)

## S

**Satellite** спутник  
**Scope** диапазон, охват  
**Score** два десятка, множество  
**Seal** изолирующий слой  
**Semiconductor** полупроводник  
**Set** набор, комплект  
**Shielding** экранирование  
**Space** пространство  
**Specimen** образец

## T

**Technician** специалист  
**Terminal** оконечное устройство  
**Tune** настраивать  
**Turn** поворачиваться

## U

**Unlike** в противоположность

## V

**Vary** изменяться  
**Velocity** скорость  
**Volume** объем

## W

**Wire** провод

## ЛИТЕРАТУРА

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