



*Popular-scientific  
and Technical Texts  
for Students*

*Tallinn 1969*



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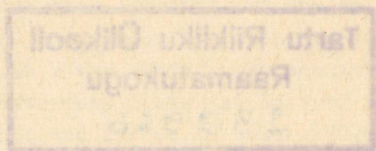
TALLINNA POLÜTEHNILINE INSTITUUT  
Keelte kateeder

POPULAR-SCIENTIFIC AND TECHNICAL TEXTS

FOR STUDENTS

compiled by

L. LASSMANN



ARHIIVKOGU

Tallinn  
1968

## PREFACE

The present collection of technical and popular-scientific texts is meant for the first and second year students. The texts have been chosen from various British and American periodicals and from the Daily Worker, the source being mentioned under each text. The articles are unadapted, but some of them are abridged. More complicated constructions and expressions difficult to understand have been commented upon, so the texts can also be used for home-reading. The collection is supplied with an alphabetical English-Estonian-Russian vocabulary which also contains some words that have been included in the textbooks for secondary schools.

The collection has primarily been compiled for the use of the students of the Tallinn Polytechnic Institute.

Tartu Riikliku Ülikooli

Raamatukogu

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## POWER-STATION CONTROLLED BY COMPUTER

The first computer-controlled start-up of a 200-megawatt power-station boiler and generator was demonstrated at West Thurrock (Essex).

A Ferranti Argus computer replaces the human operator who may make up to 1,000 operations to start the boiler from cold, run up the turbine and accept full load. This scheme is thought to be the first-ever computer control at a coal-fired station. The easier problem of running oil-fired electrical generating plant has been solved in America and other countries.

This large and efficient power-station will supply 1,300 megawatts when completed, enough power for the whole of Essex, Suffolk and Norfolk in winter.

The computer has been attached to one of the station's generating units and can run up the machines more safely and consistently than can a man. Safety and consistency are all-important in power-stations where the loss of supply from one 200-megawatt unit one day could cost of 50,000<sup>1</sup> by having to switch over to less efficient stations.<sup>2</sup>

Some 90,000 tons of coal from the Northumberland coal-field will be used here weekly to meet soaring winter power demands. But when the load eases in spring, experiments will be tried to dial the requested load for any time in the future like the housewife's cooker which switches itself on to prepare a meal when she is out shopping.

The computer showed how it could cope capably with cases of plant and control failure. If the computer failed it would isolate itself and raise an alarm.

Daily Worker, Nov. 21, 1964

## RUSSIA PLANS BIGGER TURBINES

In the Soviet Union plans have been prepared for the production of single-shaft steam turbines of 500 MW capacity. The first of these turbines is to be built during 1963, according to the Soviet Information Service; work is in the design stages.

"In the present calculations and sketches," chief designer of the Kharkov turbine plant, L. Shubenko, writes in Pravda, "we already discern the outlines of a single-shaft steam turbine of 750 MW. We are approaching the technical solution and development of a really gigantic steam-turbine set with a capacity of 1,500 MW on a single shaft."

From further information it is apparent that the Russians, by making use of these large size units, are aiming to construct thermal power-stations of 4,000 to 5,000 MW capacity.

Engineering, 1963, Vol. 195, No. 5048

## SOLAR POWER STATIONS ON THE MOON

Will the USSR pave the moon with solar cells and beam the resulting electric power to earth? That's the prediction made by Nobel Prize-winning<sup>3</sup> Russian chemist Nikolai N. Semyonov in an article which appeared in the American Bulletin of the Atomic Scientists.

Emphasizing the importance placed on electric power by Soviet scientists, Semyonov said that by the end of this century the problem of transmitting electricity across great dis-

tances by radio - or perhaps by laser beams - would be solved. Thus the moon, exposed to the full intensity of sunlight, would become the earth's major power station.

Popular Science, Apr., 1964

### SUPERCONDUCTING ELECTROMAGNETS

In the superconducting state a current, once started in a circuit, flows indefinitely because there is no resistance loss. The property of superconductivity has been known for quite a long time, but there is now a great deal of interest in it and a great deal of work is being done on it. This is mainly directed towards producing high-intensity magnetic fields.

Westinghouse have produced a magnet which produces 30,000 gauss. It weighs 25 lb, has an outside diameter of 6.2 in. and a field uniformity of 8% within a 4-in. diameter sphere. The operating temperature is  $4.2^{\circ}\text{K}$ , obtained with liquid helium.

This is by no means a limit for it is reported that Westinghouse have developed a magnet with a field of 100,000 gauss. In this case, the field is produced in a one-eighth inch hole through the centre, but the outside diameter is only 7 in. The wire of the coil is partly niobium-zirconium and partly of a new alloy known as HI-120.

The current in a superconducting electromagnet does not need an external e.m.f. to keep it flowing, but it does need one to start it. In one case, at least, the generator has itself been made superconducting and produces about 800 A.

In one model several magnets rotate close to and parallel with a set of superconducting flat plates connected together by superconducting wire. The magnetic fields cause a local loss of superconductivity in the plates producing, as it were, a series of 'holes' of normal conductivity in the otherwise superconductive material. As the magnets move over the plates, the 'holes' move with them and current is generated.

In one model there are no moving parts. Three fixed electromagnets are used and fed with alternating current to produce a rotating magnetic field.

Industrial Electronics, June, 1964

*Zanell* *refers*  
TELEVISION RECORDING BECOMES PORTABLE

*ultra* *video* *recording*  
Television's potential value as a teaching aid is immense. Its one major drawback in using broadcasts, is that teachers must arrange their lessons and their timetables to suit television programmes. There is also little possibility of recording material for re-showing later.

*video* *recorder*  
Technically, the invention of videotape in 1956 got round these difficulties by making possible the recording of sound and vision, but it remained cumbersome and costly. Now the Ampex Corporation of the USA, the inventors of videotape, have produced a portable 130 lb recorder, the VR-1500. It records live action or programme material on magnetic tape for immediate showing or later replay through television receivers. It is one-twentieth the size and one-quarter the price of earlier recorders. There has also been a reduction of two-thirds in the cost of tape.

*video* *recorder*  
This reduction in size and price, together with simplification of operation and maintenance, make the VR-1500 reasonable for many schools. They might even build up tape libraries, in much the same way that some keep films.

*video* *recorder*  
As well as recording broadcast material, including current affairs documentaries, the VR-1500 could be used to tape costly or elaborate scientific experiments or workshop situations. Indeed, one of its most exciting possibilities, as far as training in industrial subjects is concerned, is in bringing job situations into the classroom with greater immediacy than is at present possible, but at the right moment to combine with theoretical studies.

Engineering, 1963, Vol. 195, No. 5059

*развлечение*

## A NEW HOME ENTERTAINMENT SYSTEM

One of the most impressive and complete home entertainment systems is now being marketed in the United States. It is most exciting. Housed in a nine foot long cabinet it contains everything in the way of sound and television reproduction<sup>4</sup> that its owner can desire - an a.m., f.m. stereo tuner record changer, stereo control panel and pre-amplifier, stereo amplifier and loud speakers, a four-track tape-recorder and reproducer, a colour television receiver and a video tape-recorder capable of recording up to an hour and a half.

In addition there is a vidicon camera unit which can be used with the video recorder or with the colour television receiver itself, together with a timer to switch on the recorder for a given programme without further attention or to record one programme while another is being viewed, and finally twin microphones for stereo recording.

Electronic Engineering, Jan., 1964

### THREE HANDS FOR EVERY WORK

The British scientist, Professor Meredith Thring, who is developing a robot housewife says that it will probably be best if it has three hands.

The professor says that the three-handed robot, in scouring a pan, would pick it up in two hands and hold it up in front of the third, which would rotate a pan scourer.

The professor says the most difficult problem is to make the machine recognize different types of objects and deal with them.

The ideal solution would be to enable it to "see" the position and character of objects without touching them, by means of light, radar or other electromagnetic radiation, or even by sound pulses as a bat does.

Daily Worker, Feb. 27, 1964

## A ROBOT AT HOME

How would you like a robot that lived under the stairs and, working to a programme, could creep out and do all the housework?

The machine would have a memory so that it could be taught to put the things away in the right place.

The six main things such an automaton could do are:

1. Lay or clear the table;
2. Make beds and change sheets;
3. Dust, sweep and clear things away (and move the furniture back to the right place);
4. Wash clothes in a machine and iron them;
5. Wash floors, baths, basins, sinks and cookers;
6. Prepare food, but not cook it, as most people find this interesting.

Impossible? Such an invention could probably be developed in about ten years.

It might even look a little like the popular idea of a robot with arms able to handle things. The arms would be sensitive to weight and touch. The essential inwards would be an upright box with electronic equipment and batteries. At the base would be a self-propulsion mechanism.

When it had finished work, it would put itself in the cupboard and connect itself to the mains to recharge its batteries.

Before you dismiss the supersonic slave as unlikely, think how little science is yet applied in the home. Science can aid the housewife and lighten toil.

Daily Worker, Dec. 23, 1963

## AUTOMATIC TRAFFIC CONTROL

Traffic control is a field in which electronics is beginning to play a part.

*необходимый материал*  
The ideal seems to be the completely automatic control of the traffic lights throughout a whole town by means of a computer. The scheme calls for vehicle sensors to be built into roads on the approaches to all traffic lights and connected to a central computer, which is continuously fed with information on the number of vehicles approaching every traffic light in the town. *ночью по утрам*

The computer processes this information and works out an optimum pattern of traffic-light switching to deal with the traffic and then directly control the lights to conform to that pattern. It repeats this process as the traffic pattern changes, so that the lights always work to an optimum pattern for the traffic. *оптимально*

This is not a dream. Such a system actually exists on a small scale. It was tried in Toronto a few years ago, and a permanent one is now being installed. At the end of 1963 it controlled only a hundred traffic lights. By the end of 1964 it controls 1,000. Existing traffic lights are used, with a converter box to permit the computer to take control. The vehicle sensors are inductive loops in the roads. The communication channels between the computer and the sensors and lights are all narrow band. *сов*

It is reported that the small-scale pilot scheme cut the average delay to vehicles by 11% in the evening and by 25% in the morning rush-hours and increased speed from 12 m.p.h. to 16 m.p.h. To obtain the same improvement by road works would cost £15 million, whereas the cost of the computer system is around £1 - £2 only. *срочный*

Industrial Electronics, Jan., 1964

#### AUTOMATED SUBWAY *инженер*

An automatic engine driver, said to be the first of its kind, has been tested in the Moscow subway. *инженер*

According to a report in the April, 1963, issue of USSR, "The automatic engine driver is an electronic device that

The Stanford computer is designed to take in information from photocells or microphones and figure out what it is supposed to do, even if the problem is not exactly like those it has been programmed to solve. It is one of several attempts, under way at a number of laboratories, to build machines that will not need programming in machine language, but can be taught basic procedures in ordinary language. They will solve problems just like men.

Popular Science, Jan., 1963

### A NEW ELECTRON MICROSCOPE

Scientists may soon get their first actual glimpse of an atom. Dr. A.P. Wilska of the University of Arizona is now building a redesigned electron microscope which, he says, will permit scientists to see much thinner slices of matter and distinguish the atoms in a molecule. His changes, oddly enough, weaken the powerful electron beam, but increase the microscope's resolution power.

In the new design, the interior of each lens is shaped into a cone instead of a tube; as a result, slower-acting electrons are expected to give greater contrast to matter under study.

Popular Science, Jan. 1963

### LASER BEAMS

The development of the laser has been very rapid. Since its discovery, the phenomenon of Light Amplification by Stimulated Emission of Radiation has captured the attention of scientists around the world. At present its potential appears to be almost beyond limit, and there can be little doubt that the laser will become a commonplace and essential part of everyday life.

The laser, in essence a lamp, is remarkable in that it emits a type of light never before produced by man, and never

solves differential equations continuously. The device takes into account the contour of the road, the distance to the next station, the weight of the train and its braking distance. It keeps to schedule with a precision even a very experienced human engine driver would find hard to maintain.

"Throughout the entire testing period, during which the experimental trains travelled more than 43,000 miles and carried some four million passengers, not a single instance occurred that would cause us to doubt its reliability. When all trains are on our circuit line equipped with these automatic drivers, we expect to increase our traffic capacity considerably, raise our train speed, and reduce the intervals between trains to 70 sec."

Mechanical Engineering, June, 1963

#### A NEW ELECTRONIC EAR

Deaf since birth, a Los Angeles woman can now hear through an electronic "ear" which was surgically incised into her skull by a neurosurgeon. The two-ounce device carries signals on only one channel from a lapel microphone to the auditory nerve, but this permits her to distinguish words. The next model can be placed just under a patient's skin, the inventor says; eventually, a multi-channel "ear" will be able to approximate normal sound reproduction.

Popular Mechanics, May, 1963

#### THE ADAPTING MACHINE

Stanford University scientists have built an electronic computer that learns to get along with its own defects. When first put together, it contained parts that did not operate - misconnected wires, shorts, and open circuits - yet it worked well when turned on. Such manlike adaptability is needed for space-rocket systems, which often wreck a multimillion-dollar shot when a single relay breaks down.



Generating nuclear energy from the fusion of atoms of heavy hydrogen depends on providing temperatures of about a million degrees Centigrade. The laser can provide those conditions.

The laser can transmit light to the moon's surface and receive the reflections back on earth. This offers the possibility to examine the moon's surface in greater detail than before.

The laser, producing coherent light, means that the range of transmission frequencies is increased enormously. Many thousands more television channels will become available.

The laser beams are used in medicine to destroy tumours.

It is not difficult to appreciate the vast potential which the laser has for the benefit of mankind.

Comment, Dec. 14, 1963

#### MORE COHERENT RAYS

The graser may succeed the laser, as the laser followed the maser. Maser was coined from "microwave amplification by stimulated emission of radiation," and laser stands for "light amplification by..." the same thing. Graser would stand for "gamma-ray amplification..." etc. (Gamma rays are one of the kinds of radiation naturally emitted by radio-active substances. They are higher in energy than X-rays, but not as powerful as cosmic rays.)

The Russians are working on the graser.<sup>8</sup>

B.V. Chirkov has published a theoretical study in the Soviet Journal of Experimental and Theoretical Physics. He thinks a very pure crystal, "pumped" with a powerful source of radiation (such as "hard" X-rays), much as a ruby crystal is pumped with high-intensity light in one form of laser, could be stimulated to emit coherent gamma rays - pulses of high-energy radiation perfectly in step.

Graser research might bring forth the "death ray" that the laser falls short of, since gamma rays are dangerous to living tissue. Whereas natural gamma rays pop off in all

directions from radioactive materials, graser radiation could be aimed directly at a target. Gamma rays also penetrate water easily, so the graser could be used for underwater communication - or as an antisubmarine weapon.

Popular Science, Feb., 1964

### RAW MATERIALS FROM ASTEROIDS

Capturing asteroids to make use of their raw materials may be only a few years off, says an astronomical scientist in a recent issue of Astronautics and Aerospace Engineering. They could either be captured and propelled into an earth orbit, he says, or they could be brought to earth for mining - chiefly for nickel and iron. Asteroids range in size from one to 500 miles in diameter, and sometimes pass close to the earth in their orbit of the sun.

Popular Mechanics, June, 1963

### "FIREPROOF" CARBON

Carbon, burned as fuel on earth, may turn out to be a "fireproof" structural material in space. Theoretically, carbon should burn three times faster than such space materials as tungsten and molybdenum. But at temperatures of 3000 degrees and pressures one-fortieth that at sea level, tungsten, for instance, actually burns 12 times faster than carbon.

A scientist explains the phenomenon by saying that carbon atoms exhibit "self-control" once oxidation reaches a certain point in outer-space conditions. Other materials cannot achieve similar controls and burn at speeds closer to their theoretical maximums.

Popular Mechanics, Sept., 1963

## SURVEY OF EUROPEAN CHEMICAL PLANT CONSTRUCTION

The sectors of chemical plant building which show the highest growth rate in Europe are organic chemicals, plastics and fertilizers. Before 1970, more than half of the total energy will come from oil. However, the newer chemical projects in Europe reflect the increasing exploitation of natural gas reserves.

### Pipeline Progress

The year 1963 has seen a steady extension of the arteries linking oil and gas resources with the new refineries and chemical complexes. In West Germany, construction was completed of the 178-mile Rhine-Danube pipeline which will supply crude oil to the new refineries in Bavaria. Karlsruhe is also linked with Marseilles by a new pipeline and now a further pipeline is to link Trieste with Ingolstadt.

Less intricate, but more extensive, is the pipeline network that is being developed in Eastern Europe, and the year saw the bringing into operation of the northern branch of the "Friendship" pipeline linking the U.S.S.R. with the other Comecon countries, the southern branch having been brought into operation the previous year. Within the U.S.S.R., the first section of the world's biggest gas pipeline, linking Bokhara with the Urals, was completed. The Ordjonikidze-Tbilisi gas pipeline, which passes through the Caucasian mountains at a height of 8000 ft, was also completed. Among various pipeline projects in Eastern Europe, it is noteworthy that Czechoslovakia and the U.S.S.R. have decided to build a 320-mile natural gas line from Lvov in the Ukraine to Bratislava.

### Some Highlights of Chemical Expansion

#### East Germany

The gross product of the chemical industry rose from DM. 6800 million in 1955 to DM. 12,200 million last year/1963/. The highest rate of production increase is in plastics and fibres, while the output of sulphuric acid, calcium carbide

and phosphatic fertilizers has trebled during the last four years. An important contribution to plastics production will be made by Leuna II petrochemical complex now under construction. This will include two cracking plants and two gas separation units, to produce 100,000 tpa ethylene from benzene; a phenol synthesis plant 30,000 tpa acetone; a high-pressure polyethylene plant for 24,000 tpa, etc.

#### France

Governmental plans for chemical industry development were modified and the anticipated investment for 1963 was reduced to about £65 million<sup>10</sup> compared with £104 million in 1962. A further reduction in investment for 1964 is expected. However, a sign of development of the petrochemical sector is the plan to build a steam cracking plant at Feyzin, with an input capacity of 1 mtpa naphtha. This plant should start production in 1966.

#### Poland

The nitrogen fertilizer complex at Pulawy, near Warsaw, will be in full production by 1970, when fertilizer output should reach 670,000 tpa - half of Poland's current total. Other output at Pulawy will include 100,000 tpa of PVC, compared with the present Polish output of 18,000 tpa. The 35,000 tpa plant being built at Tarnow will add further to this total.

Another major Polish project is the refinery-petrochemical complex at Plock, which is to be on stream in the latter half of 1964. The initial capacity of 2 mtpa of crude will be raised to 6 mtpa by 1967, to yield 350,000 tpa of chemicals, including propylene and ethylene. The complex will include a number of units for synthesis based on propylene or isobutylene.

#### Spain

Present chemical output falls short of home demand, but there are ambitious plans to treble output during the next 15 years. With only two refineries in operation, petrochemicals are still in their infancy.

## U.S.S.R.

Priority is given to the chemical industry in the Soviet Union's economic plan for 1964-1965, with fertilizers, plastics and fibres ranking high in the list. During the next seven years, chemical production is to increase by 36 per cent, gas production by 40 per cent. Two fifths of all capital investment in the chemical industry is assigned for raising output of fertilizers and agricultural chemicals. The completion of cross-country pipeline networks, mentioned earlier in this survey, will help in these plans.

While the Soviet Union still seeks Western know-how and even equipment for certain types of chemical projects, its chemical plant fabricating industry has been expanded considerably, the investment in this type of activity having been as much over the past year as in the four previous years taken together.

## United Kingdom

The chemical production index for 1963 showed an increase over 1962. Organic chemicals, plastics and pharmaceuticals stand out as the leading growth sectors. The year was notable for the number of new town's gas plants. A big event in the gas industry was the high-pressure coal gasification plant near Birmingham, with a capacity of 40 mcf.

## Refineries

The completion of new pipelines has considerably increased refinery capacity. In West Germany distillation capacity at the end of 1963 showed, at 58 million tpa, an increase of about 30 per cent over the previous year's capacity.

Nearing completion in East Germany is the Schwedt refinery, with an initial capacity of 2 mtpa but destined to be expanded to an eventual 24 mtpa, which would make it the biggest in Europe or even in the whole world. The Polish refinery at Plock is also nearing completion.

October 1963 saw the official opening of the new oil refinery near Strasbourg in France, which is supplied with crude oil from the Middle East and the Sahara via the Marseilles-Strasbourg-Karlsruhe pipeline.

In the U.K., the bringing on stream of extensions to existing refineries has added 5 mtpa to the country's refining capacity, while other refineries of 6.3 mtpa will bring a further increase.

#### Plastics and Synthetic Rubber

This continues to be an outstanding growth sector. In the U.S.S.R. and Eastern Europe, plastics, along with fertilizers, are being given priority in capital investment plans. Polyolefins are prominent in current projects.

In the U.K., there are plans for expansion in polyethylene, high-density polyethylene and other plastics plants. Elsewhere in Western Europe, plastics facilities continue to be added to existing petrochemical complexes.

Highlights of the synthetic rubber are the U.K.'s first butyl rubber plant at the Esso refinery, Fawley, and the first polybutadiene plant at Grangemouth. France now has its first cis-polybutadiene plant, which uses Ziegler type catalysts. In Germany, 1.4-cis-polybutadiene rubber is claimed to have unique properties.

#### Heavy Inorganic Chemicals and Fertilizers

Ammonia is, along with methanol, an important product of petroleum refining and major building block for a number of chemicals apart from fertilizers. Current projects reflect the latest trends in ammonia synthesis; for instance, the steam-naphtha process features in a number of projects for ammonia synthesis gas, as well as town's gas.

Especially noteworthy ammonia projects include plants at Billingham, switch to partial oxidation of fuel oil for a latest project in Norway, the Roumanian complex at Craiova, and the synthesis gas plant for the Dutch State Mines in the Netherlands. The last-mentioned plant will at first use as feedstock a methane fraction separated from a coke-oven gas, but will later change to natural gas. Associated with the ammonia projects are a number for the manufacture of nitric acid and urea.

Phosphatic acid and phosphatic fertilizer projects also

new departures in process technology. Some of the largest sulphuric acid and superphosphate plant building activities are to be found in Poland, Hungary and related countries. The Soviet Union's cheapest superphosphate will be produced at Kedainay, in Lithuania, where a big new combine will be completed next year.

British Chemical Engineering, 1964, No. 3,4

#### SOVIET PROGRESS WITH ULTRASONICS FOR MACHINE TOOLS

Russian scientists and engineers have succeeded in making ultrasonic machine tools of outstanding efficiency.

Tests on one of these machines showed an efficiency three times as great as that of the West German "Lefeld" machine and claims are made that this is eight to ten times greater than that of any other machine tools of the same capacity manufactured in the USA, the UK or West Germany.

The Russian  $1\frac{1}{2}$  kW machine was able to remove up to 50 cu. mm of hard alloy or up to 4,000 cu. mm of glass per minute.

A second machine with a capacity of 4 kW "destroyed" 100 cu. mm of alloy and up to 9,000 cu. mm of glass during the same period. This is the most powerful ultrasonic cutting machine in the world. The processed surface was much superior to that obtained with other types of machine tools.

This work was reported recently at the Soviet Academy of Sciences. It was described as one of the biggest achievements of Russian science in the year 1963.

Investigations which led to the satisfactory checking of one of the five different theories which it was thought could explain the cutting process, were helped by superspeed, microfilming.

It transpired that the sole cause of the "destruction" by ultrasonics was the blows delivered at a speed 20,000 cycles per second at particles of abrasive lying on the material which was being machined.

It is stated that Soviet industry will start the mass

production of machine tools developed from the two experimental models.

Engineering, 1964, Vol. 197, No. 5102

## LUNAR VEHICLE DRIVE WITH EARTH-BOUND APPLICATIONS<sup>11</sup>

A major requirement for a lunar surface vehicle is an extremely low fuel consumption or some regenerative system. In the USA an engineer has suggested an unconventional regenerative power system. The new system should be capable of 24 hour operation at speeds up to 25 miles an hour without refueling.

Hydrogen gas, produced by heating liquid hydrogen, would drive a turbo-generator to provide a primary source of electric power for the traction motors. The hydrogen would then be introduced into a fuel cell which would produce additional electricity for the vehicle. The hydrogen would combine with lithium in the cell to produce lithium hydride which would be stored aboard the vehicle. A fixed nuclear reactor fueling station could break down the lithium hydride into its components.

This system would require only 1,247 pounds of fuel to do the same job as 145,000 lb of fuel used by a liquid hydrogen power source in one year. On board nuclear power systems would present weight and radiation problems and would not provide a cooling system. Solar cell generators would not be practical because of the long lunar nights and ordinary combustion engines would require large quantities of fuel and oxygen. The hydrogen would be converted from its liquid state into gas by the body heat of persons and by the heat of electrical and electronic systems. The refueling station would consist of a nuclear reactor to break down the lithium hydride into its components. The hydrogen would be compressed, liquefied, and stored for re-use.

This power system would have ready application to earth-bound transports such as cross-country buses and ocean vessels. The system is completely without exhaust.

Engineering, 1963, Vol. 195, No. 5046

## FLYING OCEAN LINER

Seaplanes are regarded as extinct in Western aviation circles but Soviet airplane designer Georgi Beriev wants to build a 2,000 passenger, 560-m.p.h. flying boat. He claims the craft could handle the passenger volume of 20 land-based jet transports or six France-class ocean liners, at costs competitive with both.<sup>12</sup> The monster would have eight jet engines and three decks. Beriev designed the Russian Be-10 twin-jet seaplane, which has set 12 world speed, altitude, and pay load records since 1961.

Popular Science, Jan., 1964

## FACTORY-MADE FLATS

Industrialized or system building is the most powerful new tool the building industry has received for many years.

The advantages of industrialized or system building - that is, transferring the bulk of the construction work into a factory, leaving only the assembly of the prefabricated units to be done at site - go deeper than mere acceleration of the job, although speed of execution has become important. When applied to repetitive housing units, such as blocks of flats, it offers substantial economies of labour. It also gives greater certainty to time due to the removal of "wet" trades from the job and rendering them unaffected by the weather. Design and estimating time can be considerably reduced. Moreover, even much of the finishing work can be transferred to the factory, giving improved quality and reliability. Such work embraces direct application of decorative finishes to concrete surfaces, the prefabrication of services and supplying prepainted joinery.

There are, of course, disadvantages. A major criticism of the first industrialized building systems was that of dull and monotonous appearance.<sup>13</sup> More flexibility is a feature of more recent systems - flexibility in respect both of lay-

out, still using a relatively small number of different units, and in details such as finishes, doors and windows.<sup>14</sup>

Engineering, 1964, Vol. 197, No. 5099

#### USING AN EXPLOSION TO BUILD A DAM

It is reported from Russia that one of the most powerful man-made earthquakes ever will be produced this spring /1964/. A total of 5,000 tons of ammonia dynamite will be detonated to form a dam in the Tien Shan mountains, USSR. The dam will consist of  $2\frac{1}{2}$  cu. m of rock fill, piled 280 ft high across the valley of the River Malaya Alma-Atinka.

The purpose of the dam will be to shield the city of Alma-Ata against torrents of mud and rock which are prevalent in the valley. It will also act as a sieve by allowing the river water to pass while holding back large stones and flotsam.

A mile long tunnel has been built to divert the river proper. The dam material will come from a large chamber cut in solid rock which is ready to be charged with dynamite.

Engineering, 1964, Vol. 197, No. 5106

#### SPACE TOWNS WILL BE IN ORBIT

by

Anatoli Blagonravov

Vice-president of the International  
Commission for Space Research and  
member of the Presidium of the  
Academy of Sciences of the U.S.S.R.

The flight of the Voskhod carrying a group of scientists into space is a magnificent achievement - yet only a step to solving more complicated tasks. More group flights of scientists will undoubtedly be carried out in the future with ever larger groups flying for longer periods.

Space observatory towns with a resident population will be placed in permanent orbit round the earth, and rockets will provide two-way communication with the observatory staff. Long before this, of course, there will be reliable systems of satellites for weather observation, world television, navigational and other purposes. But the establishment of observatory towns in permanent orbit will mark the final stage of man's conquest of the earth's space environment.

How little we knew only a few years ago, when we launched the first sputnik in 1957! I remember the nitrogen-filled sphere of aluminium alloy with its four long aeri-als. It carried only a radio and batteries and a tiny fan to circulate its nitrogen atmosphere.

Could such a sputnik tell us much? Yes, a great deal - for it was the very first. The speed of its deceleration revolutionized our notions of the density of the upper atmosphere. It enabled us to decide on methods of tracking earth satellites.

Most important of all, it proved that continuous reliable radio communication with objects in space was possible. Until then we did not know exactly whether radio waves could pass through the ionosphere, which was then thought to be a layer impenetrable by almost all wavelengths, just as the light of the invisible spectrum cannot pass through a mirror.

The second sputnik with the dog Laika on board answered a question of no less importance: was life possible in space? Laika gave her life to reply: "Yes, man can fly here."

The third sputnik had an entirely different task, that of making a detailed study of conditions in outer space.<sup>15</sup> It was an automatic laboratory, which recorded atmospheric pressure, the concentration of positive ions in the atmosphere, the intensity of the sun's corpuscular radiation, the composition of primary cosmic radiation, the distribution of protons and heavy nuclei in cosmic rays, micrometeorites, the earth's electrostatic and magnetic fields, the temperature inside and outside the sputnik, its electrostatic charge...

The data we received from Sputnik 3 was used, together with later data, to prepare for the Voskhod flight. Sputnik 3 studied micrometeorites, about which we then knew very little. We did not know the extent of the danger, the chances of encountering large meteorites, or the damage small meteorites might cause.

The first spaceships followed almost the same orbit as the sputniks, but their construction was different in principle. They had to have hermetically sealed cabins, a system maintaining constant chemical composition, pressure, temperature and humidity of the air, and a landing system.

The first  $4\frac{1}{2}$ -ton spaceship on May 15, 1960 carried a load equivalent to a man's weight. The landing system had not yet been completed and the spaceship burned up on entering the lower atmosphere. But the next spaceship, with the dogs Byelka and Strelka on board, landed safely. Three more spaceships were launched before Gagarin's flight of April 12, 1961.

I think everyone remembers the later flights. Not one of them repeated a previous flight, each surpassed previous ones in duration or in other respects.<sup>16</sup>

Soviet scientists are conducting space research in three directions.

The first is the study and conquest of the earth's space environment.

The second is the study and conquest of the moon, our nearest planet.

The first rocket toward the moon was launched on January 2, 1959, the next rocket landed there on September 14, 1959, and the third rocket has photographed the reverse side of the moon.

Animals, one must suppose, will land on the moon first. Man will go there only when a way of returning spaceships to earth has been worked out.<sup>17</sup>

But before then, there will be many manned flights to the vicinity of the moon, orbiting it many times at different heights. These flights will study conditions along the whole route from earth to moon, make detailed maps of the lunar surface and study the space environment of the moon.

The first stage of lunar research will be completed when permanent laboratories are established there. Detailed studies will, of course, take centuries, for it is an entire new world we are dealing with.

The third direction of space research is study of the solar system and nearer planets. Only the first steps have been taken here, with the Soviet probes to the vicinity of Venus /1961/ and Mars /1962/. Radio contact with the latter probe was maintained over 62 million miles.

It must be clearly understood that manned flights to planets of the solar system are infinitely more difficult than to the moon. Automatic space stations will make very many reconnaissance flights along the interplanetary routes and only when they have brought back a great variety of data will the first manned expeditions set out.

It goes without saying that the crews on these interplanetary expeditions will be even greater in number than those sent to the moon.<sup>18</sup>

But no matter how far spacecraft shall fly in the future, carrying expeditions of scientists from our earth, the flight of the Voskhod will always be memorable as the first flight ever of a multi-seat spaceship.

Daily Worker, Nov. 7, 1964

#### TO THE PLANETS BY THE SUN

Calculations that have been made at the computing centre of the Soviet Academy of Sciences are claimed to show that flights to other planets of the solar system can be made with the help of a "sun sail" - a special light reflecting surface attached to a sputnik.

Using such "sun sail" travel the figures suggest that a flight to Mars would take 122 days, to Venus 164 days, Mercury about 200 days, Jupiter 6.6 years, Saturn 17 years and Uranus some 49 years.

In a report presented to the USSR congress on theoretical and applied mechanics held at Moscow University, it was recalled that the problem of using the pressure of the Sun's rays to move a spacecraft has been studied in principle by Konstantin Tsiolkovsky. In recent years some work has been published on the "solar sail", noting in particular its advantages over other engines for space travel. One main advantage is that additional expenditure on power is unnecessary and another that not only can the heavy engine be dispensed with but also the fuel for it.<sup>19</sup>

According to Anatoly Zhukov and Vladimir Lebedev, an acceleration of about 2 mm per second can be given to a space apparatus, by light power, provided solar sails of reasonable size are used.

Reports of Soviet astronomical research during 1963 state that it has been established that the so-called solar wind is in fact a continuous stream of plasma which in practice does not depend on the phase of solar activity.

Engineering, 1964, Vol. 197, No. 5108

#### MEASURING A FLASH OF LIGHT

It is reported that an instrument has been developed at Yerevan University (Armenia) which can measure the energy of a flash of light irrespective of the intensity or duration.

It consists of a hermetically sealed glass cylinder about 18 cm long, inside which there is a double hollow cone wound of thin copper wire. The cone has a small orifice. A beam of light entering the cone is repeatedly reflected from the walls and raises their temperature. This increases the resistance of the wire and the change is recorded on conventional instruments. From the change the absolute value of the energy of the light flash can be calculated.

Special claims for the instrument are simplicity and reliability and the fact that no particular conditions are needed for its operation - in particular, no vacuum.

Engineering, 1964, Vol. 197, No. 5101

#### SCIENCE AT HOME

Science could aid the housewife and lighten toil by using new materials and methods.

There are already vacuum cleaners, washing machines, refrigerators, etc.

Taps have been developed recently that turn on when a hand comes near and turn off when the hand retreats, all without touching the tap.

An ultrasonic "sewing"-machine without thread bonds all fibrous materials, woven and non-woven, natural and man-made.

Deep-freeze storage of food could keep it fresh for months.

Greater variety of cooking methods could be employed by production of cheap, efficient, quick-cooking micro-wave ovens and infra-red grills.

The pots, developed from ceramics used in space research, can be put straight on the hottest gas or electric ring.

Man-made fibre materials can be used for bedclothes, soft furnishings, carpets and even furniture, to make cleaning easier and maintenance almost unnecessary.

More unbreakable household goods will be made, and more disposable ones. Attractive plastics pottery and disposable paper plates are now available.

More hard-wearing, attractive clothes are made from man-made fibres like nylon, terylene, and so on. This may be paralleled by development of paper clothes, attractive but disposable, and cheap, wear-once clothes from viscose rayon fibres.<sup>20</sup> Even experimental plastics houses have been built in England and in the Soviet Union.

It will seem in ten years time there is little technical obstacle to building the home that literally runs itself.  
Daily Worker, Dec. 23, 1963

#### HEALTH ODDS FOR CIGARETTE SMOKERS

The American Cancer Society recently completed a study of men over 40. From a total group of 422,094 men over 40 who were studied, the researchers picked 36,975 pairs of "twins" for detailed analysis. These pairs consisted of men who were very much alike in personal history, living habits, and health - except that one "twin" smoked 20 or more cigarettes a day, while the other man had never smoked regularly.

Out of the two groups, 662 nonsmokers died in the three-year period covered,<sup>21</sup> but 1,385 of the cigarette smokers died. In all age groups, the percentage of smokers who died was about twice as high as the percentage of nonsmokers. As for cancer, 110 of the smokers died of lung cancer, but only 12 of the nonsmokers. The figures for all kinds of cancer are: smokers, 261; nonsmokers, 96. Twice as many deaths, due to heart diseases, occur among smokers of any age group.

At first glance, smoking appears to help against violent death (due to accident, suicide, murder, etc.). The American Cancer Society explains that other causes are competing to get the smoker, whose health is generally poorer than that of the nonsmoker,<sup>22</sup> so he is not as likely to live until he is hit by a truck.

The smoker of a pack a day or more is roughly twice as likely to die during any period as the nonsmoker.

Popular Science, March, 1964

## COMMENTARIES

<sup>1</sup> £ 50,000 - 50,000 pounds /pound sterling/: £ - pound (sterling) - naelsterling /inglise rahaühik/ - фунт (стерлинг), денежная единица.

<sup>2</sup> Safety and consistency are all-important in power-stations where the loss of supply from one 200-megawatt unit one day could cost £ 50,000 by having to switch over to less efficient stations. - Töökindlus on kõige tähtsam jõujaamades, kus ühe 200-megavattise agregaadid energiakadu ühe päeva jooksul võib maksma minna 50 000 naela, kui on vaja ümber lülitada väiksema võimsusega jaamadele. - Бесперебойная работа имеет самое важное значение на электростанциях, где потеря энергии агрегата в 200 мегаватт за один день может обойтись в 50 000 фунтов, так как в таком случае надо переключаться на станции с меньшей мощностью.

<sup>3</sup> Nobel Prize-winning - Nobeli preemia laureaat - Лауреат Нобелевской премии.

<sup>4</sup> Housed in a nine foot long cabinet it contains everything in the way of sound and television reproduction - Olles paigutatud üheksa jala pikkusesse kasti, sisaldab ta kõike heli reprodutseerimise ja televisiooni alal - Будучи помещена в ящик длиной в 9 футов, она содержит всё необходимое для звуковой и телевизионной репродукции.

<sup>5</sup> In the new design, the interior of each lens is shaped into a cone - Uues konstruktsioon on iga läätsese sisemus

koosusekujuline - В новой конструкции внутренность каждой линзы конусообразная.

6

It has properties similar to those of radio waves. - Tal on omadused, mis sarnanevad raadiolainete omadega. (That, those (of) kasutatakse selleks, et vältida juba esinenud sõnade kordamist.) - Он имеет качества, похожие на качества радиоволн. (Местоимением that, those (of) пользуются, чтобы не повторять ранее названные слова в том же предложении.)

7

Vt. märkus 6 - См. примечание 6.

8

The Russians are working on the graser. - Venelased töötavad graseri kallal. - Русские работают над гразером.

9

Vt. märkus 6 - См. примечание 6.

10

Vt. märkus 1 - См. примечание I.

11

Lunar Vehicle Drive with Earth-Bound Applications - Maal rakendatav kuu sõiduki mootor - Двигатель лунной машины, применяемый и на земле.

12

... at costs competitive with both. - ... kuludega, mis võistlevad (õkonoomsuses) mõlemaga. - ... расходами, которые соревнуются с обоими.

13

A major criticism of the first industrialized building systems was that of dull and monotonous appearance. - Esimesi industrialiseeritud ehitussüsteeme kritiseeriti peamiselt üksluisse välismuse pärast (vt. märkus 6). - В первых индустриальных строительных системах критиковали главным образом однообразный внешний вид зданий (см. примечание 6).

14

... flexibility in respect both of layout ... and in details such as finishes, doors and windows. - ... paindlikkus (mitmelaadiline kasutamisevõimalus) nii üldplaani ... kui ka selliste detailide osas, nagu viimistlus, ukseid ja aknad. - ... гибкость (многообразная применимость) как в общем плане, ... так и в таких деталях, как отделочные работы, двери и окна.

15

The third sputnik had an entirely different task, that of making a detailed study of conditions in outer space. - Kolmandal sputnikul oli täiesti erinev ülesanne - uurida üksikasjalikult tingimusi kosmoses (vt. ka märkus 6). - У третьего спутника было совершенно иное задание - изучить подробно условия космоса (см. также примечание 6).

16

Not one of them repeated a previous flight, each surpassed previous ones in duration or in other respects. - Ükski neist ei sarnanenud eelmiste lendudega, iga lend ületas eelmisi kestuselt või mõnes muus suhtes. - Ни один из них не был похож на предыдущий, каждый полет превосходил предыдущие полеты по длительности или в чем-либо ином.

17

Man will go there only when a way of returning spacecrafts to earth has been worked out. - Inimene läheb sinna alles siis, kui on välja töötatud moodus kosmoselaeva maale tagasitoomiseks. - Человек пойдет туда лишь тогда, когда будет выработан способ, обеспечивающий возвращение космического корабля на землю.

18

It goes without saying that the crews on these interplanetary expeditions will be even greater in number than those sent to the moon. - On endastmõistetav, et meeskonnad neil planeetidevahelistel ekspeditsioonidel on isegi arvukamad kui need, mis Kuule saadetakse (vt. ka märkus 6). -

Разумеется, что экипажи межпланетных экспедиций даже многочисленнее тех, которые посылаются на Луну.

19

... that not only can the heavy engine be dispensed with but also the fuel for it. - ... et ei saa läbi mitte ainult raske mootorita, vaid ka kütuseta selle jaoks. -  
- ... что нельзя обойтись не только без тяжелого двигателя, но и без топлива для него.

20

This may be paralleled by development of paper clothes, attractive but disposable, and cheap, wear-once clothes from viscose rayon fibres. - Seda võib võrrelda meeldivate, kuid äravisatavate paberist riiete valmistamisega, ja odavate, kord kantavate viskoosse kunstsiidi kiududest riiete valmistamisega. - Это можно сравнить с изготовлением красивой выбрасываемой одежды из бумаги, а также дешевой, носимой только раз одежды из вискозного искусственного шелка.

21

Out of the two groups, 662 nonsmokers died in the three-year period covered - Sellest kahest rühmast suri käsitledava kolmeaastase perioodi jooksul 662 mittesuitsetajat - Из этих двух групп умерло за 3-летний период 662 некурящих.

22

Vt. märkus 6. - См. примечание 6.

VOCABULARY

A

able [eibl]	suuteline, võimeline	умелый, способный
be able	suutma, võima	мочь, быть в состоянии
aboard [ə'bo:d]	laeval, pardal laevale, pardale	на корабле, на борту на корабль, на борт
abrasive [ə'breisiv]	abrasiiv-, lihvimis- aine	абразивный или шли- фовальный материал
absolute [əbsəlu:t]	absoluutne, täielik, puhas	полный, чистый, абсолютный
absorb [əb'sɔ:b]	neelama, absorbee- rima	впитывать, абсорби- ровать
academy [ə'kædəmi]	akadeemia	академия
acceleration [ək'selə'reiʃən]	kiirendus, kiiren- damine	ускорение
accept [ək'sept]	vastu võtma	принимать
accident [ək'sidənt]	juhus, õnnetusjuh- tum	случай, несчастный случай
according /to/ [ə'kɔ:diŋ]	(millelegi) vastavalt, (millegi) järgi	согласно, в соответ- ствии с
account [ə'kaunt]	arvestus, arve	счет, расчет, отчет
take into account	arvesse võtma, ar- vestama	принимать во внима- ние, в расчет
acetone [ək'sitoun]	atsetoon	ацетон
achieve [ə't(i:v)]	saavutama; lõpule viima	достигать, добиваться; доводить до конца
achievement [ə't(i:v)mənt]	saavutus	достижение

across [ə'krɔs]	üle	через
act [ækt]	tegu, toiming: te- gutsema, toimima	дело, поступок, дей- ствовать, поступать
action [ˈæksən]	tegevus	действие
active [ˈæktiv]	aktiivne	активный
activity [æktɪviti]	tegevus: aktiiv- sus	деятельность, активность
actual [ˈæktjuəl]	tõeline, tegelik	фактический, существ- вующий, действительный
actually [ˈæktjuəli]	tegelikult, tõe- poolsest	фактически, на самом деле
adapt [ə'dæpt]	kohandama, kohane- ma	приспосабливать, приспосабливаться
adaptability [ədæptə'biliti]	kohandatavus, koha- nemisvõime	приспособляемость, применимость
adapting [ə'dæptɪŋ]	isekohastuv	приспосабливающийся
add [æd]	lisama, liitma	прибавлять, склады- вать
addition [ə'diʃən]	lisamine, lisa, liitmine	прибавление, увеличе- ние, сложение
in addition (to)	lisaks, peale sel- le	вдобавок, кроме того
additional [ə'diʃənəl]	lisa-, täiendav	добавочный, дополнительный
advantage [əd'vɑ:ntɪdʒ]	paremus, eelis, kasu	преимущество, выгода, польза
aerial [ˈɛəriəl]	antenn	антенна
aerospace [ˈɛərəspeis]	õhuruum	воздушное пространст- во
affair [ə'feə]	asi, tegu	дело
age [eɪdʒ]	vanus, iga	возраст
aid [eɪd]	aitama, abistama: abi, abivahend	помогать; вспомога- тельное средство
aim [eɪm]	siht, eesmärk: sihtima (millegi pihta at), taotlema	цель; целиться (во что-нибудь at), стремиться

airplane [ˈɛəpleɪn]	lennuk	самолет
alarm [əˈlɑ:m]	hääire, äärm	сигнал тревоги
alike [əˈlaɪk]	sarnane, samasugune	похожий, одинаковый
allow [əˈləʊ]	lubama, võimaldama	позволять, предоставлять
alloy [əˈlɔɪ]	sulam	сплав (примесь лигатура)
along [əˈlɔŋ]	piki, mööda; kaasa, kaasas; edasi	вдоль, по; по всей линии; с собой;
along with	(millegagi) kaasas, koos	вперед вместе
alternating [ˈɔ:lte:neɪtɪŋ]	vahelduv	переменный
alternating cur- rent	vahelduvvool	переменный ток
although [ɔ:lˈðəʊ]	kuigi	хотя
altitude [ˈæltɪdju:d]	kõrgus	высота
aluminium [æljuˈmɪnjəm]	alumiinium	алюминий
ambitious [æmˈbiʃəs]	auahne	честолюбивый
ammonia [əˈmʌnjuə]	ammoniaak	аммиак
amplification [æmplɪfɪˈkeɪʃən]	laiendus, võimend- us	расширение, усилие
amplifier [ˈæmplɪfaɪə]	võimendaja	усилитель
amplitude [ˈæmplɪtju:d]	ulatus, ampli- tuud	амплитуда, размах
analysis [əˈnælɪsɪs]	analüüs	анализ
(pl. analyses [əˈnælɪsi:z])		
anti- [ˈæntɪ]	vastane, vastu-, anti-	противо-, анти-
anticipate [ænˈtɪsɪpeɪt]	ootama, ette nägema	ожидать, предвидеть
apart [əˈpɑ:t]	lahus, eraldi	в стороне, отдельно
apart from	peale (millegi), midagi arvestama- ta	кроме, не считая

apparatus [æpə'reitəs]	aparaat, seadis, aparatuur	прибор, аппарат, аппаратура
apparent [ə'pɛərənt]	ilmne	ВИДИМЫЙ, ЯВНЫЙ
appear [ə'piə]	ilmuma, näima	ПОЯВИТЬСЯ, КАЗАТЬСЯ
appearance [ə'piərəns]	ilmumine: välimus	ПОЯВЛЕНИЕ; ВИД, наружность
application [æpli'keiʃən]	tarvitamine, rakendamine	применение, употребление
applied [ə'plaid]	rakendus	прикладной
apply [ə'plai]	rakendama, tarvitama	применять, употреблять
appreciate [ə'pri:ʃi'eit]	hindama, mõistma	оценивать, понимать
approach [ə'prəʊtʃ]	liginemine, juurdepaas: lähenema	приближение, подступ, подход; приближаться
approximate [ə'prɔksimeit]	lähenema, lähedane olema	приближаться, приблизительно равняться
Armenia [a:'mi:njə]	Armeenia	Армения
around [ə'raʊnd]	ümberringi: ümber	кругом; вокруг
arrange [ə'reindʒ]	korraldama, sobitama	устраивать, приспособлять
artery ['a:təri]	arter, tuiksoon /ka piltlikult/; peatee	артерия; магистраль, главный путь
article ['a:tɪkl]	artikkel, kirjutis	статья
as for	mis puutub	что касается
as it were	nii-ütelda	так сказать
assembly [ə'sembli]	kogumine, monteerimine	сбор, сборка частей
assign [ə'sain]	määrama, assigneerima	назначать, ассигновать
associate [ə'souʃieit]	ühendama, siduma; ühinema	соединять (ся), связывать
asteroid [æstə'roid]	asteroid, väikeplaneet	астероид, малая планета

astronautical [æstrə'no:tikəl]	astronautikasse, pla- neetidevahelistesse lendudesse puutuv	астронавтический, касаящийся межпла- нетных полетов
astronautica [æstrə'no:tiks]	astronautika, pla- neetidevaheliste lendude teooria	астронавтика, теория межпланетных поле- тов
astronomic(al) [æstrə'nomik(əl)]	astronoomiline	астрономический
astronomy [æs'trɒnəmi]	astronoomia	астрономия
atmosphere [ˈætməsfiə]	atmosfäär	атмосфера
atmospheric [ˈætməs'ferik]	atmosfääriline, õhu-	атмосферный, атмосферический
atom [ˈætəm]	aatom	атом
atomic [ə'tɒmik]	aatomi	атомный
attach [ə'tætʃ]	kinnitama, ühendama	прикреплять, присоединять
attempt [ə'tem(p)t]	katse, püüe	попытка, покушение
attention [ə'tenʃən]	tähelepanu, hoolit- sus, järelevalve	внимание, забота, уход
attractive [ə'træktiv]	külgetõmbav, kütkes- tav, veetlev	привлекательный, при- тягательный, заман- чивый
automatic [ɔ:tə'mætik]	automaatne	автоматический
automated [ɔ:təmeitid]	automatiseeritud	автоматизировано
automaton [ɔ:tɒmətən] (pl. automata, au- tomatons)	automaat	автомат
available [ə'veiləbl]	kasutatav, kätte- saadav	доступный, имеющийся в распоряжении
average [ˈævərɪdʒ]	keskmise	средний
aviation [eivi'eɪʃən]	aviatsioon, lennu- asjandus; õhusõidu	авиация; авиационный

band [bænd]	pael, lint; (raadio) laineala	тесьма, полоса; частота, диапазон
base [beis]	baas, alus; rajama, baseeruma	основа, база; базировать, закладывать основание
basin [ˈbeɪsɪn]	vaagen, kauss; bassein, reservuaar	миска; бассейн, резервуар
bat [bæt]	nahkhiir	летучая мышь
bath [bɑːθ]	vann	ванна
battery [ˈbætəri]	patarei	батарея
Bavaria [bəˈvɛəriə]	Baieri	Бавария
bay [beɪ]	(mere)laht	залив, бухта
beam [bi:m]	kiir, kiirgus; kiirgama	луч, сияние; излучать
benefit [ˈbenɪfɪt]	kasu, tulu	выгода, польза
benzene [ˈbenzi:n]	bensool	бензол
beyond [biˈjɒnd]	väljaspool, väljapoole; taga	по ту сторону, вне
billion [ˈbɪljən]	biljon, Am.miljard	биллион, амер. миллиард
birth [bɜːθ]	sündimine	рождение
block [blɒk]	pakk; plokk; tahatud kivi; elamukvartal	чурбан; блок; "камень"; жилищный массив
blow [bləʊ]	hoop, löök	удар
board [bɔːd]	laud, plank; (laeva) parras	доска; борт (судна)
on board	pardal	на борту
body [ˈbɒdi]	keha, kere	тело, туловище
boiler [ˈbɔɪlə]	(auru)katel	(паровой) котел
bond [bɒnd]	side; siduma	связь; связывать
bore [bɔː]	puurima	бурить
bound [baʊnd]	seotud	связанный

box [bɔks]	karp, kast	коробка, ящик
brake [breik]	pidur; pidurdama	тормоз; тормозить
branch [brɑ:ntʃ]	oks, haru; osakond	ветвь, отрасль;
break [breik]	murdma, purunema	отделение
(broke [brɔuk], broken [brɔukən])		ломать(ся), разбивать(ся), разрушать(ся)
break down	lammutama, lagun- dama; rikki minema	распадать; поломать- ся; портиться
bring forth [fɔ:θ]	esile kutsuma, te- kitama	производить, рождать
broadcast [brɔ:dka:st]	raadio- või tele- visioonisaade	радио- или телеви- зионная передача
build up	üles ehitama, järk- järgult koguma	построить, постепен- но создавать
Bukhara [bu'ka:rɔ]	Buhhaara	Бухара
bulk [bɔlk]	kogu, maht; suurem osa, enamik	объем, вместимость; основная масса, большая часть
bulletin ['bulitin]	bülletään, perioo- diline väljaanne või teadaanne	буллетень, сводка
burn [bɜ:n]	põlema, põletama, leegitsema	сжигать, гореть, пылать
burn up	ära põlema	сжигать
burst [bɜ:st]	pahvatus, purse: valgatus	взрыв; вспышка
butadiene [bu:tədaɪ 'i:n]	butadieen	бутадиен
butyl [bju:til]	butüül	бутил

С

cabin ['kæbin]	kajut, kabiin	каюта, кабина
cabinet ['kæbinit]	kabinet: (raadio)- kast	кабинет; ящик (радио- приемника)
calcium ['kælsiəm]	kaltsium	кальций
calculate [kælkjuleit]	arvutama, arvut- lema	вычислять, подсчиты- вать

calculation [kælkju'leiʃən]	arvutus, kalkulasioon	калькуляция, вычисление
call [kɔ:l]	hüüdma, kutsuma, ni- metama	звать, называть
call for	nõudma	требовать
camera ['kæməre]	fotoparaat; filmi-, televiisioonikaamera	фотографический ап- парат, кино-, теле- визионная камера
canal [kə'næl]	kanal	канал
cancer ['kænsə]	vähktõbi	рак (болезнь)
capable ['keipəbl] (of)	võimeline, suuteline	способный, умелый
capacity [kə'pæsiti]	maht; võimsus	емкость; мощность
capital ['kæpɪtl]	kapital	капитал
capture ['kæptʃə]	tabama, haarama	захватить, увлечь
capture the at- tention	tähelepanu äratama	привлечь внимание
carbide ['ka:baid]	karbiid	карбид
calcium carbide	kaltsiumkarbiid	карбид кальция
carbon ['ka:bən]	süsinik, süsi	углерод, уголь
carpet ['kæ:pɪt]	põrandavaip	ковер
carry ['kæri]	kandma, vedama, vii- ma; ule kandma, edasi andma, vastu võtma	вести, нести, носить; переносить, переда- вать. принимать.
carry out	täide viima, teos- tama	выполнять, проводить
case [keis]	juht (juhu), juhtum; olukord	случай; обстоятель- ство
catalyst ['kætəlist]	katalüsaator	катализатор
Caucasian [kɔ:'keizjən]	kaukaasia	кавказский
cause [kɔ:z]	põhjus; põhjustama	причина; причинять
cell [sel]	kong: rakk:(elektri-) element	ячейка; тюремная камера; клетка; элек- трический элемент
centigrade ['sentigreid]	sajakraadine, sajapü- galane; Celsiuse ter- momeeter	стоградусный; тер- мометр Цельсия

ceramics [si'ra:miks]	keraamika	керамика
certain [ʃə:tɪn]	kindel; teatav	уверенный; опреде- ленный
certainty [ʃə:tnti]	kindlus, kindelolek	уверенность
chain [tʃeɪn]	ahel; ahel-	цепь; цепной
chamber [tʃeɪmbə]	kamber; süvend	камера; выемка, углубление
change [tʃeɪndʒ]	muutus, muudatus; vaheldus; muutuma, muutma; vahetuma, va- hetama	перемена, изменение, замена; разнообразие; менять(ся), изме- нять(ся), заменять
channel [ʃænl]	jõesäng; kanal; väin; (raadio) helikanal	русло; канал; про- лив; звуковой тракт (радио)
character [ʃærɪktə]	tunnus; iseloom, loo- mus	характер, отличи- тельный признак, свойство
charge [tʃɑ:dʒ]	koorem; laeng; koor- mata; laadima	заряд; нагрузка; за- ряжать; нагружать
cheap [tʃi:p]	odav	дешевый
check [tʃek]	kontrollima	проверять
chemical [ʃemɪkəl]	keemiline, keemia- pl. kemikaalid, keemilised ained	химический, pl. химика- лии, химические пре- параты
chemistry [ʃemɪstri]	keemia	химия
chief [tʃi:f]	peamine, pea-	главный, основной
chiefly [tʃi:flɪ]	peamiselt	главным образом
cigarette [sɪgə'ret]	sigaret	сигарета, папироса
circle [sə:kl]	ring, ringkond	круг
circuit [sə:kit]	ringkäik; ringvool, vooluring	кругооборот; цепь, контур
circulate [sə:kjuleit]	tsirkuleerima, ringlema; ringlema panema	циркулировать; рас- пространять
cis- [sis]	siinpool	на этой стороне
cis-polybuta- diene	cis-polübutadieen	полибутадиен

claim [kleim]	nõudma, väitma, kin- nitama: nõue, preten- sioon	требовать, утверждать; требование, претен- зия
clear [ˈkliə]	selge; selgima; pubastama	ясный; очищать(ся); проясняться
clear the table	lauda koristama	убирать со стола
close [kloʊs](to)	ligiläheduses	близко
clothes [kloʊðz]	riided	платье, одежда
coal [kɔʊl]	kivisüsi	(каменный) уголь
coal-field [ˈkɔʊlfi:ld]	kivisöerajoon	каменноугольный район
coherent [kou hiərənt]	koherentne	когерентный
coil [kɔil]	kera; pool, mähis	виток; (электр.) катушка, обмотка
coin [kɔin]	münt: müntima; uut sõna looma	монета; чеканить; создавать новые слова
coke [kɔuk]	koks	кокс
combine [ˈkɔmbain]	kombain; kombineer- kombineerima; ühi- nema, ühendama, se- gunema	комбайн; комбинат; комбинировать; объ- единять(ся); смеси- вать(ся)
combustion [kəmˈbʌstʃən]	põlemine, põletami- ne	горение, сжигание
combustion engine	sisepõlemismootor	двигатель внутрен- него сгорания
Comecon [ˈkɔmikən] = Council for Mu- tual Economic Aid	(sotsialismimaade ja Nõukogude Liidu) Vastastikuse Majan- dusliku Abistamise Nõukogu	Совет взаимной эконо- мической помощи (социалистических стран и СССР)
commission [kəˈmɪʃən]	komisjon	комиссия
commonplace [ˈkɔmənpleis]	vanaalne, kulunud	банальный, избитый
communication [kəmjuːniˈkeɪʃən]	side, ühendus	связь, сообщение, коммуникация
compare [kəmˈpeɪ]	võrdlema	сравнивать, сличать
compete [kəmˈpi:t]	võistlema, konku- reerima	сопоставляться, конкурировать

competitive [kəm'petitiv]	võistlev	соперничающий, конкурирующий
complete [kəm'pli:t]	täiendam: lõpule viima; täielik, lõ- petatud; täiuslik	заканчивать; комплек- товать; полный, за- конченный; совер- шенный
completely [kəm'pli:tli]	täiesti	совершенно
completion [kəm'pli:ʃən]	lõpetamine: viimist- lus	окончание; завершение
complex [kəm'pleks]	kompleks	комплекс
complicated [kəm'plikeitid]	komplitseeritud, keeruline	запутанный, сложный
component [kəm'pounənt]	komponent, koostis- osa	компонент, составная часть
composition [kəm'pə'ziʃən]	koosseis, koostis	структура, состав
compress [kəm'pres]	kokku suruma, tihen- dama	сжимать, сдавливать
compute [kəm'pjuzt]	arvutama	считать, подсчитывать
computer [kəm'pjuztə]	elektronseade, elekt- ronarvutusmasin	счетно-решающее устройство, вычисли- тельная машина
concentration [kənsən'treiʃən]	kontsentratsioon	концентрация
concern [kən'sə:n]	suhtuma, millesegi puutuma	касаться, иметь отношение
concrete [kənkri:t]	betoon	бетон
condition [kən'diʃən]	tingimus; seisund, olukord	условие; состояние, положение
conduct [kən'dʌkt]	juhtima; tegema	вести; проводить
conductivity [kəndʌk'tiviti]	(elektri-) juhti- vus	электропроводимость
cone [koun]	koonus	конус

conform [kən'fɔ:m] (to)	kohandama, ühtlustama; kohanema	сообразовать(ся), приспособлять(ся)
congress [ˈkɒŋɡres]	kongress	съезд
connect [kə'nekt]	ühendama, seostama	соединять, связывать
conquest [kɒŋkwɛst]	vallutamine, vallutus	завоевание, покорение
considerably [kən'sidərəbli]	märksa, tunduvalt	значительно
consist [kən'sist] (of)	koosnema	состоять
consistency [kən'sistənsi]	järjekindlus, püsivus	последовательность, постоянство
consistent [kən'sistənt]	järjekindel	последовательный
constant [ˈkɒnstənt]	konstantne, püsiv, muutumatu	постоянный, неизменный
construct [kən'strakt]	konstrueerima, ehitama	конструировать, строить
construction [kən'straktʃən] under construction	konstruktsioon, ehitus, ehitamine ehitusel	строение, конструкция в процессе строительства, строящийся
consumption [kən'sʌmpʃən]	tarbimine	потребление
contact [ˈkɒntækt]	kokkupuude, kontakt	соприкосновение, контакт
contain [kən'tein]	sisaldama, mahutama	содержать в себе, вмещать
continuous [kən'tinjuəs]	pidev, katkestamatu	непрерывный, постоянный
contour [ˈkɒntʊə]	kontuur, piirjoon	контур, очертание
contrast [ˈkɒntɹæst]	kontrast, vastand	контраст, противоположность
contribution [kɒntri'bju:ʃən]	kaastöö; panus	вклад, сотрудничество
control [kən'trɒl]	kontroll, juhtimine; kontrollima, juhtima	управление, контроль, регулирование; управлять, контролировать, регулировать

conventional [kən'venʃənl]	konventsionaalne, tavaline	обусловленный, обычный
convert [kən've:t]	muutma, pöörama	превращать, обращать
converter [kən've:tə]	konverter, muundur	конвертер, преобразователь тока
cooker [ˈkʊkə]	keetja; keeduseadis	плита; варочный прибор
cool [ku:l]	jahe; jahutama, jahutama	прохладный; охладить(ся)
cooling system [ˈku:lɪŋsistim]	jahutussüsteem	система охлаждения
cope [koup] (with)	toime tulema	справиться
copper [ˈkɒpə]	vask	медь
corporation [kɔ:pə'reiʃən]	korporatsioon; Am. aktsiaselts	корпорация; (ам.) акционерное общество
corpuscular [kɔ:'pʌskjʊlə]	korpuskulaarne	корпускулярный
cosmic [ˈkɒsmɪk]	kosmiline	космический
cost [kɒst]	maksma; maksumus, kulu	стоять; стоимость, расход
costly [ˈkɒstli]	kulukas, kallis	дорогой, ценный
cover [ˈkʌvə]	katma, varjama; haarama, millegi kohta kaima	закрывать, скрывать; охватывать
cracking [ˈkrækɪŋ]	krakkimine	крекинг
craft [kra:ft]	laev(ad), õhusõiduk(id)	судно, суда, самолет(ы)
creep [kri:p] (crept)	roomama, ronima	ползать, пресмыкаться
crest [krest]	(laine)hari	гребень
crew [kru:]	meeskond	экипаж, команда
criticism [ˈkritisizəm]	kriitika, arvustus	критика
cross-country [kros'kʌntri] cross-country bus	otse kulgev; mard- maastik kaugesõidu autobuss	пересеченная местность автобус дальнего следования

crude [kru:d]	toores, toor-; tootlemata, puhasta- mata: toornafta	сырой, необработанный, неочищенный; сырая нефть
crystal ['kristl]	kristall	кристалл
cumbersome [kʌmbəsəm]	tülikas, kohmakas	громоздкий, нескладный
cupboard [kʌbəd]	kapp	шкаф
current ['kʌrənt]	vool: käibiv, keh- tiv: kaesolev, jook- sev	ток, струя, течение; ходячий, текущий.
current affairs	jooksvad sündmused	текущие события
curtain ['kɜ:tɪn]	eesriie: kate	занавес, завеса
cut [kʌt]	lõik, lõhe: lõikama, karpima, raiuma	разрез, порез; ре- зать, снижать, рубить
Czechoslovakia [tʃɛkouslou'vɑ:kɪə]	Tšehhoslovakkia	Чехословакия
cycle ['saɪkl]	tsükkel, ring: ringprotsess	цикл, круг; круго- вой процесс
cylinder [sɪlɪndə]	silinder	цилиндр

D

dam [dæm]	(kaitse)tamm	дамба, плотина
damage [dæmɪdʒ]	vigastus, kahju	убыток, повреждение
dangerous [deɪndʒərəs]	ohtlik	опасный
data ['deɪtə]	andmed	данные, сведения
deaf [def]	kurt	глухой
deal [di:l]	osa, hulk	количество
a great deal	palju	много
deal [di:l] (dealt [delt], dealt) (with)	tegelema, tege- mist tegeema	общаться, иметь дело
death [deθ]	surm	смерть
deceleration [di:si:leɪ'reiʃən]	aeglustumine	замедление

decide [di'said]	otsustama	решать
decide on	valima	выбрать
deck [dek]	tekk, laevalagi	палуба
decorative [dekə'retɪv]	dekoratiivne	декоративный
defect [di'fekt]	puudus, defekt, viga	недостаток, дефект, изъян
degree [di'gri:]	kraad; aste	градус; степень
delay [di'lei]	viivitus; viivi- tama	задержка; удержи- вать
deliver [di'livə]	üle andma, kätte toimetama, (hoopi jne.) andma	передавать, достав- лять, наносить (удар и т.п.)
demand [di'ma:nd]	nõue, nõudmine: nõudma	требование, спрос; требовать
density [ˈdensiti]	tihedus	густота, плотность
departure [di'pɑ:tʃə]	lahkumine	отправление
new departure	uus lähtepunkt, uus algatus	новая отправная точка, новое начи- нание
depend [di'pend] (on)	olenema, sõltuma (millestki, kellest- ki)	зависеть (от)
describe [dis'kraib]	kirjeldama	описывать
design [di'zain]	plaan, projekt, konstruktsioon; pla- neerima, projektee- rima, konstrueerima	план, проект, кон- струкция; составлять план, проектировать, конструировать
designer [di'zainə]	konstruktor: jones- taja	конструктор, чертежник
desire [di'zaiə]	soovima, ihaldama	желать, хотеть
destine [ˈdestin]	määrama	назначать, предназ- начать
destroy [dis'trɔi]	hävitama	разрушать, уничто- жать
destruction [dis'trʌkʃən]	hävitus, hävitamine	разрушение, уничтожение
detail [ˈdi:teɪl] in detail	detail, üksikasi üksikasjalikult	подробность, деталь обстоятельно, подробно

detailed [di'teild]	detailne, üksikas- jalik	подробный, детальный
detonate [detouneit]	plahvatama, plahva- tama panema	детонировать, взрывать(ся)
develop [di'veləp]	arendama, arenema; konstrueerima, välja- tootama	развивать(ся); кон- струировать, разрабатывать
development [di'veləpmənt]	arendamine, arenemi- ne; areng	развитие; развертывание
device [di'vais]	seadeldis, aparaat	устройство, прибор
dial [daiəl]	telefoninumbrit vali- ma: (telefoni teel või automaatselt) tel- lima	набирать номер; за- казать(по телефону или при помощи ав- томата)
diameter [dai'æmitə]	diaameeter, läbimõõt	диаметр, поперечник
diamond [daiə'mænd]	teemant	алмаз
different [difrənt]	erinev, isesugune	другой, различный
differential [difə'renʃəl]	diferentsiaal-	дифференциальный
direct [di'rekt]	sirge, otsene, va- henditu; suunama, juhtima	прямой, непосредст- венный; направлять, управлять
direction [di'rekʃən]	suund, siht	направление
directly [di'rektli]	otse	прямо
disadvantage [disəd'vɑ:ntidʒ]	kahju, halvemus	невыгода, невыгодное положение, неудобст- во
discern [di'sɜ:n]	märkama, eristama, vahet tegema, nage- ma	различать, распозна- вать, отличать, видеть
dismiss [dis'mis]	lajali saatma, valla- dama; tagasi lükkama	отпускать, уволь- нять, гнать от себя, прогонять
dispense [dis'pens] (with)	ilma milletagi läbi saama	обходиться без чего-л.
disposable [dis'pəuzəbl]	kõrvaldatav	устраняемый
distillation [disti'leiʃən]	destillatsioon, des- tilleerimine	дистилляция

distinguish [dis'tiŋɡwiʃ]	eristama, vahet te- gema, markama	различать, отмечать
distribution [distri'bju:ʃən]	jaotus, levik	распределение, распространение
divert [dai'və:t]	kõrvale juhtima või poorama	отводить, отклонять
documentary [dɒkjʊ'mentəri]	dokumentaalne; doku- mentaalfilm	документальный; до- кументальный фильм
double [ˈdʌbl]	kahekordne	двойной
doubt [daʊt]	kahtlus; kahtlema	сомнение; сомневаться
doubtless [ˈdaʊtlis]	kahtlemata; arvata- vasti	несомненно; вероятно
drawback [ˈdrɔ:bæk]	halvemus, puudus	недостаток, отрица- тельная сторона
dream [dri:m]	unenägu, unistus; und nagemä, unistama	сновидение, мечта; видеть сны, мечтать
drilling [ˈdriliŋ]	puurimine	высверливание, бурение
drive [draiv]	sõit; ajam; juhtima, sõitma; kaivitama	езда; привод; везти, ехать; управлять, двигать; приводить в движение
due [dju:](to)	tõttu, tagajärjel	благодаря, вследствие
dull [dʌl]	tuhm, tuim, igav	тусклый, скучный, монотонный
duration [dʒuə'reiʃən]	kestus, vältus	продолжительность
dust [dʌst]	tolm; tolmu pühkima	пыль, вытирать пыль
Dutch [dʌtʃ]	hollandi	голландский
dynamite [ˈdaɪnəmaɪt]	dünamit	динамит
E		
earthquake [ˈə:θkweɪk]	maavarisemine	землетрясение
ease [i:z]	kergenema; vabanema; lõdvenema	облегчать(ся); ослаб- лять(ся); освобож- дать(ся)
economic [i:kə'nɒmɪk]	majanduslik	экономический, хозяйственный

economy [i: 'kɒnəmi]	majandus; kokkuhoid	хозяйство, экономия
efficiency [i'fiʃənsi]	(töö)jõudlus, saavutusvõime	бережливость действенность, продуктивность
efficient [i'fiʃənt]	tõhus, jõudlusvõimeline	действенный, продуктивный
elaborate [i'ləbərət]	viimistletud; keeruline	выработанный; сложный
electric(al) [i'lektrik(ə)l]	elektri	электрический
electricity [i'lek'trisiti]	elekter	электричество
electromagnet [i'lektrou'mægnit]	elektromagnet	электромагнит
electromagnetic [i'lektrou'mæg'netik]	elektromagnetiline	электромагнитный
electron [i'lektrɒn]	elektron	электрон
electronic [i'lek'trɒnik]	elektron-	электронный
electronics [i'lek'trɒniks]	elektroonika	электроника
electrostatic [i'lektrou'stætik]	elektrostaatiline	электростатический
elsewhere [els'weə]	kuskil mujal, kuskile mujale	где-нибудь в другом месте
embrace [im'breis]	embama; enesesse haarama, sisaldama	обнимать(ся); включать в себе, содержать
emission [i'miʃən]	väljasaatmine; emissioon, kiirgus	распространение; излучение, эманация
emit [i'mit]	välja saatma; kiirgama	испускать; излучать
emphasize [em'fæsaiz]	rõhutama, toonitama	придавать особое значение, подчеркивать
employ [im'plɔi]	tarvitama, rakendama	употреблять, применять

enable [i'neibl]	võimaldama	давать возможность
encounter [in'kauntə]	kohtama, kokku põr- kama	встретить(ся), столкнуться
energy ['enədʒi]	energia	энергия
engine ['endʒin]	masin, jõumasin, mootor	машина, двигатель, мотор
engine-driver (engine driver) ['endʒindraiva]	vedurijuht	машинист
engineer [endʒi'niə]	insener, masinist, mehaanik	инженер, машинист, механик
engineering [endʒi'niəriŋ]	insenerikunst: teh- nika; masinaehitus	инженерное искусство; техника; машино- строение
enormous [i'nɔ:məs]	tohutu	громадный
enter ['entə]	sisenema, sisse astuma	входить, вступать
entertainment [entə'teɪnmənt]	lõbustus, meelela- hutus	развлечение, увеселение
entire [in'taɪə]	täielik, terve, ko- gu	полный, совершенный, целый
entirely [in'taɪəli]	täiesti, täieli- kult	полностью, совершенно
environment [in'vaɪərənmənt]	ümbrus, keskkond	окружение среда
equation [i'kweiʃən]	võrrand	уравнение
equip [i'kwɪp]	varustama	оборудовать
equipment [i'kwɪpmənt]	varustus, tehnika	оборудование, техника
equivalent [i'kwɪvələnt]	ekviivalentne, sa- maväärne	равноценный, равнозначный
escape [is'keɪp]	pääsena: vabanema valja voolama	бежать; избежать; улетучиваться
essence ['esns]	olu, olemus	сущность, существо
in essence	olemuselt	по существу
essential i'senʃəl]	oluline	существенный, необходимый

estimate [estimeit]	hindama, eelarvet koostama	оценивать, состав- лять смету
establish [is'tæbliʃ]	rajama, asutama; kindlaks tegema, tõestama	основывать, учреж- дать; устанавливать, доказывать
etc. = et cetera [it'setrə] (=and so on)	ja nõnda edasi	и так далее
ethylene [eθili:n]	etüleen	этилен
European [juərə'pi:ən]	euroopa	европейский
event [i'vent]	sündmus	событие
eventual [i'ventʃuəl]	võimalik; lõplik	возможный; конечный
eventually [i'ventʃuəli]	lõpptulemusena, lõpuks	в конечном счете, в конце концов
ever [evə]	kunagi, iganes; alati	всегда; когда-либо
exactly [ig'æktli]	täpselt	точно
examine [ig'æmin]	uurima; eksaminee- rima	исследовать; экзаменовать
excess [ik'ses]	liigäär, ülemäär	избыток, излишек
excite [ik'sait]	ärritama, erutama; ergastama	возбуждать, волно- вать, возбудить
exciting [ik'saitiŋ]	erutav, põnev	волнующий, захватывающий
execution [eksi'kju:ʃən]	täideviimine, soori- tamine	выполнение, исполнение
exhaust [ig'zɔ:st]	(masinas) äratarvit- tatud gaas	отработанный газ
exhibit [ig'zibit]	näitama, osutama, esitama	показывать, прояв- лять, выставлять
exist [ig'zist]	eksisteerima, ole- mas olema	существовать
expand [iks'pænd]	paisuma; laiendama; areneema	расширять(ся); раз- вивать(ся)

expansion [iks'pʌnʃən]	ekspansioon, paisu- mine, laiendamise: toodangu jne. suuren- damine	расширение; увели- чение производства и т.д.
expect [iks'pekt]	ootama	ожидать
expenditure [iks'penditʃə]	kulutus, kulu(d), väljaminek	трата, расход
experienced [iks'piəriənst]	kogenud, vilunud	опытный, знающий
experiment [iks'perimənt]	eksperiment, katse	опыт, эксперимент
experimental [eksperi'mentl]	eksperimentaalne, katseline	экспериментальный
explain [iks'plein]	seletama	объяснять
exploitation [eksplɔi'teiʃən]	eksploateerimine, ka- sutamine	эксплуатация
explosion [iks'plouʒən]	plahvatus	взрыв
expose [iks'pouz]	eksponeerima, (päike- se jne.) katte jätma	выставлять, подвер- гать действию (солнца и т.д.)
extension [iks'tenʃən]	pikendus, laiendus	удлинение, расширение
extensive [iks'tensiv]	ulatuslik, laial- dane	обширный, просторный
extent [iks'tent]	ulatus, määr	протяжение, степень, мера
external [eks'tɜ:nl]	väline, välis-	наружный, внешний
extinct [iks'tɪŋkt]	kustunud, väljasur- nud	потухший, вымерший
extremely [iks'tri:mli]	äärmiselt, väga	чрезвычайно, очень

F

fabricate [fabrikeit]	tootma, välja mõtlemata	производить, выдумывать
facilities [fə'silitiz]	seadmed, vahendid	оборудование, приспособления, средства

fact [fækt]	fakt, tõsiasi	обстоятельство, факт
in fact	õigupoolest, tegelikult	фактически, на самом деле
fail [feil]	puuduma, mitte piisama; ebaõnnestuma; rivist välja langema	недоставать; потерпеть неудачу; выходить из строя
failure [ˈfeiljə]	luhtumine, ebaõnnestumine; avarii	неуспех, неудача; авария
fall [fɔ:l] (fell [fel], fallen [ˈfɔ:lɪn])	kukkuma, langema	падать, пасть
fall short of	mitte küündima, mitte piisama	не хватать
fan [fæn]	lehvik; ventilaator	вентилятор
far [fa:]	kaugel(t); tublisti	далеко; гораздо,
as far as	kuni, nii palju kui	намного до, насколько
feature [ˈfi:tʃə]	iseloomustav joon, isearasus; iseloomustavaks jooneks, tahtsal kohal olema	характерная черта, особенность; быть характерной чертой, занимать важное место
feed [fi:d] (fed [fed], fed)	toitma	питать
feedstock [ˈfi:dstɔk]	lähtematerjal, toormaterjal	исходный материал, сырьевой материал
fertilizer [ˈfɜ:tilaizə]	väetis	удобрение
few [fju:]	vähesed, vähe	немногие, немного
a few	mõned	несколько
fibre [ˈfaibə]	kiud, kiudaine	волокно, фибра
fibrous [ˈfaibrəs]	kiudjas, kiuline	волокнистый, фиброзный
field [fi:ld]	põld, väli; ala	поле; область
figure [ˈfiɡə]	kujund, joonis, figuur; kujutama, arvutama	фигура, облик, образ; цифра; изображать
to figure out	välja arvutama, arusaama, taipama	вычислять, понимать, постигать
final [ˈfaɪnəl]	lõplik; viimane, otsustav	конечный; окончательный, решающий

finish [ˈfɪnɪʃ]	lõpetama, lõppema: viimistlema	кончать(ся), закан- чивать; отделывать
finishing work	viimistlustöö	отделка
fire [ˈfaɪə]	tuli: süütama, sü- tima: kütma	огонь, пламя; зажи- гать, загораться; топить
fireproof [ˈfaɪəpruːf]	tulekindel	огнеупорный
fixed [fɪkst]	kinnistatud, fik- seeritud; kindlaks maaratud	неподвижный, прикреп- ленный; установлен- ный
flash [flæʃ]	välgatus, sähvatus	вспышка, сверкание
flat [flæt]	lame	плоский
flat [flæt]	korter	квартира
flexibility [fleksəˈbɪlɪti]	painduvus, paindlik- kus	гибкость
flight [flaɪt]	lend	полет
flotsam [ˈflɒtsəm]	triivivad riismed	плавающие обломки
flow [fləʊ]	voolama: wool	течь, литься; тече- ние, поток
for [fɔː] [fə]	sest, sest et	ибо, ввиду того что
form [fɔːm]	vorm, kuju; moodus- tama, kujundama	форма, фигура; со- ставлять, образовы- вать(ся)
fraction [ˈfrækʃən]	murdosaj, murd: frakt- sioon	доля, дробь; фракция
freeze [friːz] (froze [frouz], frozen [frouzn])	külmuma, külmetama: kül, külmetus	замерзать, заморажи- вать; замерзание, замораживание
frequency [ˈfriːkwənsi]	sagedus, tihedus	частотность, частота
fresh [fref]	värske	свежий
fuel [ˈfjuəl]	kütus: kütusega va- rustama	топливо, горячее; снабжать топливом
fuel cell [ˈfjuəlˈsel]	kütusepaak	топливный бак
full [ful]	täis, täielik	полный
furnishings [ˈfɜːnɪʃɪŋz]	majasüstus, maja- tarbed	обстановка, домашние принадлежности

furniture [ˈfə:nɪtʃə]	mööbel	мебель
further [ˈfɜ:ðə]	kaugem, edasine, li- sa-; kaugemale, eda- si, lisaks	более отдаленный, дальнейший; дальше, затем, кроме того
fusion [ˈfju:ʒən]	kokkusulamine; liitu- mine, uhinemine	плавка; слияние
future [ˈfju:tʃə]	tulevik	будущее

G

gamma ray [ˈgæməˈreɪ]	gammakiir	гамма-луч
gas [gæs]	gaas	газ
gasification [ˈgæsɪfɪˈkeɪʃən]	gaasistamine	газификация
gauss [gaus]	gauss	гаусс
generally [ˈdʒenərəli]	tavaliselt, üldiselt	обычно, вообще
generate [ˈdʒenəreɪt]	tekitama; genereeri- ma	порождать; генерировать
generating plant [ˈdʒenəreɪtɪŋ ˈplɑ:nt]	generaatorjaam	генераторная станция
generator [ˈdʒenəreɪtə]	generaator	генератор
get round	mööduma	обходить
get along(on)	edasi jõudma, hak- kama saama, toime tulema	преуспевать, справ- ляться с делом
gigantic [dʒaɪˈgæntɪk]	hiiglaslik, gigant- ne	громадный, гигант- ский
glance [glɑ:ns]	pilk, põgus vaade	быстрый взгляд
glass [glɑ:s]	klaas	стекло, стакан, рюмка
glimpse [glɪmps]	vilksatus, põgus pilk	мелькание, быстрый взгляд
have (get, catch) a glimpse	vilksamisi nägema	увидеть мельком

governmental [gʌvən'mentl]	valitsuse, valitsus-	правительственный
graser [greizə]	graser, gammakiir- te kvantvõimendi	гразер, квантовый усилитель гамма-лучей, гаммаквантовый усилитель
grill [gril]	lihaküpsetamisrest	рашпер
gross [grouz]	suur, paks; bruto, ko- su-	большой, толстый; брутто, валовой
growth [grouθ]	kasvamine, kasv	рост, прирост

Н

habit [hæbit]	harjumus	привычка
handle [hændl]	käsitsema, tegelema; transportima: käepi- de, sang	брать руками, обходиться; транспор- тировать, ручка, рукоятка
hard-wearing [hɑ:d'weəriŋ]	kulumiskindel, vas- tupidav	износостойкий
heading [ˈheidiŋ]	pealkiri	заглавие
health [helθ]	tervis	здоровье
heart [hɑ:t]	süda	сердце
heat [hi:t]	kuumendama, soojen- dama, kütma; kuumus, palavus, soojus	нагревать, подогревать, топить; жара, жар, теплота
height [hait]	kõrgus	высота, вышина
helium [hi:lɪjəm]	heelium	гелий
hermetically [hə:'metikəli]	hermeetiliselt, õhu- ja gaasikindlalt	плотно, герметически
highlight [ˈhaɪlaɪt]	valgusefekt; peami- ne moment või fakt	световой эффект; основной момент, факт
high-pressure [ˈhaɪ'prefʒə]	kõrgrõhu-	высокого давления
history [ˈhɪstəri]	ajalugu	история
hit [hit](hit,hit)	lööma, tabama, vigas- tama	ударять, порождать

hold [hould] (held [held], held)	hoidma, pidama: ta- gasi hoidma	держать, удерживать
hole [houl]	auk	отверстие, дырка
hollow [ˈholou]	õõnes	пустой, пустотелый
house [haus]	majutama, paiguta- ma	предоставлять жилище, помещать
household [ˈhaushould]	majapidamine: maja- pidamis-	домашнее хозяйство, домашний
housewife [ˈhauswaif]	koduperenaine	домашняя хозяйка
housework * [ˈhauswɔ:k]	majapidamistö	домашняя работа
housing [ˈhauziŋ]	elamuehitus; elamud	жилищное строитель- ство; жилище
however [ˈhauˈevə]	ükskõik kuidas, kui- das iganes; siiski, aga	как бы ни; однако, тем не менее
human [ˈhju:mən]	inimeslik, inim-	человеческий
humidity [ˈhju:ˈmiditi]	niiskus	сырость, влажность
Hungary [ˈhʌŋgəri]	Ungari	Венгрия
hydride [ˈhaɪdraɪd]	hüdriid	гидрид
hydrogen [ˈhaɪdrɪdʒən]	vesinik	водород

I

idea [aiˈdiə]	kujutlus, mõte, idee	идея, мысль, пред- ставление
ideal [aiˈdiəl]	ideaal: ideaalne	идеал, идеальный
immediacy [iˈmi:dʒəsi]	vahenditus	непосредственность
immediate [iˈmi:dʒət]	vahetu, otsene, viivitamatu	непосредственный, прямой, немедленный
impenetrable [imˈpenitrəbl]	läbitungimatu, lä- bimatu	непроходимый, непро- ницаемый
immense [iˈmens]	tohutu, määramatu	необъятный, огромный

importance [im'pɔ:təns]	tähtsus	значительность, важность
of no importance	tähtsusetu	не имеющий значения
important [im'pɔ:tənt]	tähtis	важный
impossible [im'pɔ:səbl]	võimatu	невозможный
impressive [im'presiv]	mõjukas, sügavat mõju või muljet jättev	впечатляющий, произ- водящий глубокое впечатление
improve [im'pru:v]	parandama, paranema	улучшать(ся)
improvement [im'pru:vmənt]	parandamine, paranemine	улучшение
inch [intʃ]	toll (=2,54 cm)	дюйм
incise [in'saiz]	sisse lõikama	надрезать
include [in'klu:d]	sisaldama, kaasa arvama	заключать, включать
including [in'klu:diŋ]	kaasa arvatud	включая, в том числе
increase [in'kri:s]	suurenema, kasvama; suurendama	увеличивать(ся); расти
increase [in'kri:s]	suurenemine, juurdekasv	увеличение, прирост
indeed [in'di:d]	tõesti, tõepoolest	в самом деле, действительно
indefinitely [in'definiitli]	lõpmatult, määramatult	бесконечно, неопределенно
independent [in'di'pendənt]	sõltumatu, iseseisev (of - -st)	независимый, самостоятельный
index [indeks]	näitaja; sisuregister, loend	индекс, указатель, алфавитный указатель
induce [in'dju:s]	põhjustama; sundima; esile kutsuma	побуждать, заставлять; вызывать
inductive [in'dʌktiv]	induktiivne	индуктивный
industrial [in'dʌstriəl]	tööstuslik, tootmis-	промышленный, производственный

industrialize [in'dʌstriəlaiz]	industrialiseerima, tööstuslikuks muutma	индустриализировать
industry [indʌstri]	tööstus; töökus, usi- nus	промышленность; трудолюбие, приле- жание
infancy [infənsi]	lapsepõlv; lapsekin- gades olev, valjaare- nemata	младенчество; ранняя стадия развития
infinitely [ɪnfɪnɪtli]	lõpmatult	бесконечно
information [ɪnfə'meɪʃn]	informatsioon, teade	информация, сведения
infra-red [ɪnfərə red]	infrapunane	инфракрасный
initial [i'niʃl]	alg-, algus	начальный, первоначальный
inorganic [ɪnɔ:'gænik]	anorgaaniline	неорганический
inside [ɪn'saɪd]	seespool, sees; sissepöole	внутри; внутри
install [ɪn'stɔ:l]	sisse seadma, ins- talleerima; montee- rima	устраивать, установ- ливать; монтировать
instance [ɪnstəns]	näide, näidis: juh- tum	пример, случай
for instance	näiteks	например
instead [ɪn'sted]	selle asemel	вместо
instead of	(millegi) asemel	вместо (чего-либо)
instrument [ɪnstrəmənt]	instrument	инструмент
intense [ɪn'tens]	pingeline, inten- siivne: jõuline, tugev	сильный; интенсивный, напряженный
intensity [ɪn'tensiti]	pingesus, inten- siivsus; tugevus	интенсивность, на- пряженность; сила
interior [ɪn'tiəriə]	sisemus	внутренность
interplanetary [ɪntə'plænɪtəri]	planeetidevaheline	межпланетный
interval [ɪntə'veɪl]	(aja-, ruumi-) va- hemik, vahemaa, vahe- aeg	промежуток, расстоя- ние, перерыв

intricate [in'trikit]	keeruline	запутанный, сложный
introduce [intrə'dju:s] (into)	sisse juhtima, sisse tooma	вводить, вставлять
invention [in'venʃən]	leiutus, leiutamine	изобретение
inventor [in'ventə]	leiutaja, leidur	изобретатель
investigation [investi'geiʃən]	uurimine, (teaduslik) uurimistöö	расследование (научное) исследование
investment [in'vestmənt]	kapitalimahutus, investeeering	(капитало-)вложение
inwards [inwədz]	sisikond, sisemus	внутренности, внутренность
ion [aiən]	ioon	ион
ionosphere [aiənəsfie]	ionosfäär	ионосфера
iron [aiən]	raud; triikraud; pesu triikima	железо, утюг; утюжить, гладить
irrespective [iris'pektiv] (of)	(millestki) hoolimata, (millelegi) vaatamata	безотносительный, независимый (от)
irrigation [iri'geiʃən]	niisutamine, irrigatsioon	орошение, ирригация
isobutylene [aizoubuti'li:n]	propaanmetüül, isobutüleen	изобутилен
issue [isju:]	väljaanne, (ajalehe, ajakirja) number	выпуск, номер (газеты, журнала)

J

jet [dʒet]	juga: reaktiivmootor; reaktiiv-	струя; реактивный двигатель; реактивный
job [dʒɒb]	töö	работа, труд
joinery [dʒɔinəri]	tisleritöö	столярная работа

Jupiter [ˈdʒu:pɪtə]	Jupiter (planeet)	Юпитер (планета)
just [dʒʌst]	just, parajasti	точно, как раз
K		
keep [ki:p] (kept [kept], kept)	pidama; hoidma; säilitama	держатъ; хранить
to keep to	millestki kinni pidama, millegi juures pusima	придерживаться, держаться чего-л.
Kharkov [ˈkha:kəf]	Harkov	Харьков
kind [kaɪnd]	liik, laad, sort	род, сорт, вид
knowhow [ˈnouhau]	oskus, asjatundlikkus; tootmise saladused	умение, знание дела; секреты производства
L		
laboratory [ləˈbɔ:rətəri]	laboratoorium	лаборатория
labour [ˈleɪbə]	töö	труд, работа
land [lænd]	maanduma	приземляться, делать посадку
landing [ˈlændɪŋ]	maandumine; maandumis-	посадка; приземление; посадочный
lapel [ləˈpeɪ]	käänis, reväär	отворот, лацкан
laser [ˈleɪzə]	optiline kvantgeneraator, kvantvõimendi, laser	оптический квантовый генератор, квантовый усилитель, лазер
latter [ˈlætə]	viimane	последний
the latter	viimatimainitu	последний (из двух названных)
launch [lɔ:ntʃ]	heitma, viskama; kosmoseraketti välja saatma	бросать; запускать
layer [ˈleɪə]	kiht	слой
layout [ˈleɪaʊt]	kava, plaan; asend	план, схема; расположение
lead [li:d] (led [led], led)	juhtima, viima	руководить, вести

least [li:st] at least	vähim määr vähemalt	малейшее количество по крайней мере
leave [li:v] (left [left], left)	jätma, lahkuma	оставлять, покидать
length [leŋθ]	pikkus	длина
lens [lenz]	lääts	линза
level [ˈlevl]	tase, tasapind	уровень
light [lait]	valgus, (lambi)tu- li: valgge; valgus- tama, suutama	свет, огонь (лампы); светлый; освещать, зажигать
light [lait]	kerge, kergekaaluli- ne	легкий, легковесный
lighten [ˈlaitn]	kergendama	облегчать
likely [ˈlaikli]	tõenäoline	вероятный
limit [ˈlimit] beyond limit	piir piiramatu	граница, предел неограниченный
line [lain] gas line	joon, liin gaasijuhe	линия, черта газопровод
liner [ˈlainə]	reisilaev või -lennuk	лайнер, пассажирский пароход или самолет
link [liŋk]	lüli; ühendama	(связующее) звено; соединять, связывать
liquefy [ˈlikwifaiz]	veeldama, vedelda- ma	превращать в жидкое состояние
liquid [ˈlikwid]	vedel	жидкий
list [list]	nimestik	список
literally [ˈlitərəli]	täht-tähelt, sõna otseses mõttes	буквально, дословно
lithium [ˈliθiəm]	liitium	литий
lithium hydride [ˈliθiəm ˈhaidraid]	liitiumhüdriid	гидрид лития
Lithuania [liθju: ˈeinjə]	Leedu	Литва
live [laiv]	elav	живой

load [laud]	koorem, koormus; laadung	груз, бремя; нагрузка
local [ˈloukəl]	kohalik, lokaalne	местный
loop [lu:p]	silmus, aas	петля, виток, крюк, бугель
loss [lɔs]	kactus, kadu	потеря
loud-speaker [ˈlaudˈspi:kə]	valjuhääldaja	громкоговоритель
low [lou]	madal; vähene	низкий; небольшой
lunar [ˈlu:nə]	kuu-	лунный
lung [lʌŋ]	kops	легкое

М

machine [mæˈʃi:n]	masin, tööpink; toopingil tootlema	машина, станок обрабатывать на станке
cutting machine	metallilõikepink	металлорежущий станок
machine tool [mæˈʃi:ntu:l]	tööpink	станок
magnet [ˈmæɡnɪt]	magnet	магнит
magnetic [ˈmæɡˈnetɪk]	magnetiline	магнитный, магнетический
magnificent [ˈmæɡˈnɪfɪsnt]	suurepärase, suure- jooneline	великолепный, изумительный
main [meɪn]	peamine, pea	главный, основной
mains	(elektri-, veeto- rustiku)võrk	сеть (электрическая, водопроводная)
maintain [meɪnˈteɪn]	säilitama	сохранять
maintenance [ˈmeɪntɪnəns]	säilitamine; hool- damine, korrashoid- mine; ekspluatee- rimine	сохранение, уход, содержание в исправ- ности; эксплуатация
major [ˈmeɪdʒə]	suurem, peamine	большой, главный
make [meɪk] (made [meɪd], made)	tegeha, valmistama; sundima, panema (mi- dagi tegeha)	делать, готовить; заставлять; побуждать

man [mæn]	mehitama, isikulise koosseisuga komplekterima	укомплектовывать личным составом, поставить людей
mankind [mæn'kaind]	inimkond	человечество
manlike [mænlaik]	inimesetaoline	человекоподобный
man-made [mænmeid]	kunstlik	искусственный
manufacture [mænju'fæktʃə]	tootma; tootmine	производить, производство
map [mæp]	(maa)kaart	карта (географическая)
mark [ma:k]	märkima, tähistama	отмечать, обозначать
market [ma:kit]	turg; turustama	рынок, продать на рынке
Mars [ma:z]	Marss (planeet)	Марс (планета)
Marseilles [ma:'seilz]	Marseille	Марсель
maser [meizə]	kvantgeneraator, kvantvoimendi, maser	квантовый генератор, мазер
mass [mæs]	mass	масса
mass production	vooltootmine	поточное производство
material [mə'tiəriəl]	materjal	материал
matter [mætə]	aine, materia; asjaolu: tähtsus	вещество, материя; дело; сущность
no matter	pole tähtis, ükskõik	безразлично, все равно
maximum [mæksiməm]	maksimum; maksimaalne	максимум, максимальный
mean [mi:n]	keskmine; kesktee	средний, середина
means	vahend(id), abinõu(d)	средство, способ
by means of	(millegi) abil	посредством
by no means	muidugi mitte, mitte ühelgi juhul	никоим образом, ни сколько, отнюдь не
by this means	sel viisil	таким образом
measure [meʒə]	mõõt, määr, mõõtuhiik; mõõtma, hindama	мера, мерка; масштаб; измерять, оценивать
mechanics [mi'kæniks]	mehaanika	механика

mechanism [mekənizm]	mehhanism	МЕХАНИЗМ
medicine [medsin]	arstiteadus; arstim	МЕДИЦИНА; ЛЕКАРСТВО
meet [mi:t] (met [met], met)	kohtama; (nõuet) rahul- dama	ВСТРЕЧАТЬ; УДОВЛЕТ- ВОРЯТЬ (ТРЕБОВАНИЯ)
megawatt [megəwɔt]	megavatt (miljon vatti)	МЕГАВАТТ (1 МИЛЛИОН ВАТТ)
member [membə]	liige	ЧЛЕН
memorable [memərəbl]	mälestusväärne, unustamatu	ПАМЯТНЫЙ, НЕЗАБВЕННЫЙ
memory [meməri]	mälu, mälestus	ПАМЯТЬ, ВОСПОМИНА- НИЕ
mention [menʃən]	mainima, nimetama	УПОМИНАТЬ, ССЫЛАТЬСЯ НА
Mercury [mə:kjuri]	Merkuur (planeet)	МЕРКУРИЙ (ПЛАНЕТА)
mere [miə]	paljas; lausa, ilm- ne; ainult	ПРОСТОЙ; ЯВНЫЙ, СУ- ЩИЙ; ТОЛЬКО
meteorite [mi:tjərait]	meteoriiit	МЕТЕОРИТ
methane [meθein]	metaan	МЕТАН
methanol [meθənəl]	metanool, metüül- alkohol	МЕТАНОЛ, МЕТИЛОВЫЙ СПИРТ
method [meθəd]	meetod, menetlus	МЕТОД, СПОСОБ
microfilming [maikroufilmiŋ]	mikroülesvõte	МИКРОСЪЕМКА
micrometeorite [maikrou'mi:tjərait]	mikrometeoriiit	МИКРОМЕТЕОРИТ
microphone [maikrəfoun]	mikrofon	МИКРОФОН
microscope [maikrəskoup]	mikroskoop	МИКРОСКОП
microwave [maikrəweiv]	mikrolaine	МИКРОВОЛНА
mine [main]	kaevandus; kaevan- dama	РУДНИК, КОПЬ, ШАХТА; ПРОИЗВОДИТЬ ГОРНЫЕ РАБОТЫ
mining [mainiŋ]	mäeasjandus, kaevan- dustööd	ГОРНОЕ ДЕЛО, РАЗРА- БОТКА КОПЕЙ

mirror [ˈmirə]	peegel	зеркало
mis- [mis]	vale(sti), väär(alt)	неправильно, ложно
misconnected [ˈmiskəˈnektid]	valesti ühendatud	неправильно связан- ный
model [ˈmɔdl]	mudel	модель
modify [ˈmɔdifai]	muutma, modifitseer- ima	видоизменять
modulation [mɔdjuˈleɪʃən]	modulatsioon, pinge vaheldus või modulee- rimine	модуляции
molecule [ˈmɔlikjuːl]	molekul	молекула
molybdenum [mɔˈlibdinəm]	molübdeen	молибден
monster [ˈmɔnstə]	koletis, monstrum	чудовище
moon [muːn]	kuu (taevakeha)	луна
moreover [mɔːˈrouvə]	pealegi	кроме того
motion [ˈmouʃən]	liikumine	движение
motor [ˈmoutə]	mootor	двигатель, мотор
move [muːv]	liigutama, liikuma panema, liikuma; liigutus	двигать(ся), приво- дить в движение; движение
mud [mʌd]	muda, pori	грязь, ил
multi- [mʌlti]	mitmekordne, mitme-	много- (в сложных словах)
murder [ˈmɜːdɜ]	mõrv, tapmine	убийство

N

naphtha [ˈnæfθə]	nafta, destilleeri- tud nafta: kütte- õli; petrooleum	сырая нефть , лигроин; гарное масло; керосин
natural [ˈnætʃrəl]	loomulik, loodus- lik	природный, естественный
naturally [ˈnætʃrəli]	loomulikult, mui- dugi	естественно, конечно

navigation [nævi'geiʃən]	laevandus, navigat- sioon	судоходство, навигация
near [niə]	lähinema	приближаться
necessary [nesisəri]	hädavajalik, tarvi- lik	необходимый, нужный
neon [ni:ən]	neoon	неон
Netherlands [ˈneðələndz]	Madalmaad, Holland	Нидерланды, Голландия
network [ˈnetwə:k]	võrgustik, (teede, juhtmete jne.) võrk	сетка, сеть (дорог, проводов и т.д.)
neurosurgeon [ˈnju:rə'sɜ:dʒən]	neurokirurg	нейрохирург
nickel [ˈnikl]	nikkel	никель
niobium [nai'oubiəm]	niobium	ниобий
nitric acid [ˈnaitrik'æsid]	lämmastikhape	азотная кислота
nitrogen [ˈnaitridʒən]	lämmastik	азот
non- [nɒn]	mitte-, eba-, -tu	не
non-woven	mittekoitud	нетканый
normal [ˈnɔ:məl]	normaalne	нормальный
notable [ˈnoutəbl]	tähelepanuväärne, tähtis	достопримечательный, значительный
note [nəʊt]	märke, märkus; märkama, üles märki- ma; tähelepanu pöö- rama; näitama	заметка; примечание; замечать, обращать внимание; делать за- метки; указывать
noteworthy [ˈnoutwɜ:ði]	tähelepanuväärne, märkimisväärne	заслуживающий внима- ния, достопримеча- тельный
notion [ˈnouʃən]	mõiste, kujutus; arusaam	понятие, представле- ние
nuclear [ˈnju:kliə]	tuuma-	ядерный
nucleus [ˈnju:kliəs]	tuum	ядро

number [ˈnʌmbə]	arv, number; hulk	число, количество;
a number of	palju	номер
nylon [ˈnaɪlən]	nailon	много
		нейлон

0

object [ˈɔbdʒɪkt]	ese, objekt	предмет, объект
observation [ˌɔbzəːˈveɪʃən]	vaatlus, tähelepanek	наблюдение
observatory [əbˈzəːvətəri]	observatoorium	обсерватория
obstacle [ˌɔbstəkl]	takistus	препятствие
obtain [əbˈteɪn]	saavutama, kätte saama	добывать, получать
occur [əˈkɜː]	juhtuma, esinema	случаться, попадаться
ocean [ˈouʃən]	ookean	океан
odd [ɒd]	liigne, paaritu; veider	лишний, нечетный, непарный; странный
odds	väljavaated, šansid	шансы
offer [ˈɔfə]	pakkuma	предлагать
official [əˈfɪʃəl]	ametlik	официальный
oil [ɔɪl]	õli; nafta	масло; нефть
once [wʌns]	kui kord, niipea kui	(служит для усиления) раз
only [ˈounli]	ainult, alles	только
open circuit [ˈoʊpənˈsɜːkɪt]	avatud ahel, katkestatud ahel	разомкнутая цепь, прерванная цепь
operate [ˈɔpəreɪt]	töötama, tegutsema	работать, действовать
operating [ˈɔpəreɪtɪŋ]	töö-, töötamis-	рабочий
operation [ˌɔpəˈreɪʃən]	tegevus, toiming; operatsioon; ekspluaateerimine	действие; операция; эксплуатация
operator [ˈɔpəreɪtə]	operaator; masina käitaja, masinal tootaja	работающий на машине, управляющий машиной; оператор

optimum [ˈɔptimʌm]	optimum; optimaalne, soodsaim	наиболее благоприятные условия; оптимальный
orbit [ˈɔ:bit]	orbiit; orbiidil liikuma	орбита; вращаться по орбите
ordinary [ˈɔ:dnri]	tavaline, harilik	обычный, обыкновенный
organic [ˈɔ:'gænik]	orgaaniline	органический
orifice [ˈɔrifis]	ava, avaus	отверстие
original [ə'ri:dʒənəl]	algne; originaalne	первоначальный, подлинный, оригинальный
otherwise [ˈʌðəwaiz]	muidu, teisiti, vastasel korral	иначе, по-другому, или же
ounce [auns]	unts = 28,35 g	унция = 28,35 г
outer [ˈaʊtə]	väline, välis-	внешний, наружный
outer space [ˈaʊtə speis]	maailmaruum	вселенная
outline [ˈaʊtlain]	piirjoon, visand	контур, эскиз
outlines	peajooned	основы
output [ˈaʊtput]	toodang	продукция
outside [ˈaʊt'saɪd]	väliskülg; väline, välis-; väljas, väljaspool	наружная сторона; наружный, внешний; снаружи, наружу; вне
outstanding [aʊt'stændɪŋ]	esileulatuv, silmapaistev	выдающийся, знаменитый
oven [ˈʌvn]	ahi	печь
owner [ˈaʊnə]	omanik	владелец, собственник
oxidation [ˈɔksi'deɪʃən]	oksüdeerimine, hapendamine	окисление
oxygen [ˈɔksidʒən]	hapnik	кислород

pack [pæk]	pakk	пакет, пачка
paint [peɪnt]	värvima; värv	красить, краска
panel [ˈpænl]	paneel; juhtimiskilp	панель, щит
control panel	juhtimiskilp või -pult	щит или пульт управления
parallel [ˈpærəleɪ]	paralleel; paralleelne; võrdlema	параллельный, сравнивать
part [pɑ:t]	osa	часть; роль
particle [ˈpɑ:tɪkl]	osake	частица
particular [pɑˈtɪkjələ]	eriline; üksikasi	особенный; частность, подробность
in particular	eriti	в частности,
partly [ˈpɑ:tli]	osalt	в особенности
pass [pɑ:s]	õõduma, läbima; uletama (tänavat jne.)	проходить, пересекать
patient [ˈpeɪʃənt]	kannatlik; patsient, haige	терпеливый; пациент, больной
pattern [ˈpætən]	muster, näidis; struktuur, süsteem	образец, узор, структура, система
pave [peɪv]	sillutama, (teed) katma	мостить, замачивать
pay load [ˈpeɪləʊd]	kasulik koormus	полезный груз
peculiar [piˈkju:liə]	iseäralik, omapärane; eriomane (millelegi)	особенный, странный; принадлежащий или свойственный исключительно чему-либо
penetrate [ˈpenɪtreɪt]	tungima, läbistama	проникать внутрь, проходить сквозь
per [pə:]	läbi, kaudu, kohta, -s	за, на, в
per sec.	sekundis	в секунду
per cent [pəˈsent]	protsent	процент
percentage [pəˈsentɪdʒ]	protsent	процент

perfectly [pə:'fiktli]	täiuslikult, täieli- kult; täiesti	совершенно, вполне, отлично
period [piəriəd]	periood, ajavahemik	период, промежуток времени
permanent [pə:'mənənt]	jaäiv, püsiv, perma- nentne	постоянный, перманентный
permit [pə:'mit]	lubama, võimalda- ma	позволять, давать возможность
personal [pə:'sni]	isiklik	личный
petrochemical [petrə'kemikəl]	naftakeemiline	нефтехимический
pharmaceutical [fɑ:mə'sju:tikəl]	farmatseutiline, ravim	фармацевтический; лекарство
phase [feiz]	faas	фаза
phenol [fi:nəl]	fenool, karbool- hape	фенол, карболовая кислота
phenomenon [fi'nɔmi:nən] (pl. phenomina) [fi'nɔminə])	fənomen, haruldane nähtus	необыкновенное яв- ление, феномен
phosphate [fɔsfeit]	fosfaat	фосфат
phosphatic [fɔs'fætik]	fosfaat-	фосфатный
phosphoric acid [fɔs'fɔrik'æsid]	fosforhape	фосфорная кислота
photocell [fəutəsəl]	fotorakk, foto- element	фотоэлемент
photograph [fəutəgrɑ:f]	foto; fotografee- rima	фотография; фотогра- фировать
pick [pik]	noppima, korjama; valima	собирать, срывать, выбирать
pile [pail]	virn, kuh; kuhjama	куча, штабель; складывать
pilot [pailət]	loots; lendur; kat- se-	лоцман, пилот, опытный
pipeline [paiplain]	torujuhe, naftaju- he	трубопровод, нефте- провод

place [pleis]	asetama, paigutama	помещать, ставить
planet [ˈplænit]	planeet	планета
plant [plɑːnt]	vabrik, tehas; sead- mestik, seadeldis; agregaat	завод, фабрика; оборудование, уста- новка, агрегат
plasma [ˈplæzmə]	plasma	плазма
plastic [ˈplæstik]	plastmass, plasti- line mass	пластмасса, пласти- ческая масса
point [pɔɪnt]	punkt	точка, пункт
Poland [ˈpəʊlənd]	Poola	Польша
poly- [ˈpɒli]	hulk-, hulga-, mit- me-, polu-	много-, поли-
polyolefin(e) [ˈpɒliˈɒlɪfɪn]	polüolefiin	полиолефин
poor [pʊə]	vaene, vilets, halb	бедный, скудный, плохой
pop [pɒp]	plõksuma, paukuma; akki tulema või tor- mama	трескаться, хлопать; бросаться, шнырять
popular [ˈpɒpjələ]	populaarne, üldi- selt levinud	популярный, общерас- пространенный
population [ˈpɒpjʊˈleɪʃən]	rahvastik, elanik- kond	население, жители
portable [ˈpɔːtəbl]	kantav	портативный, переносный
position [pəˈziʃən]	positsioon, asend, asupaik	позиция, положение, местоположение
positive [ˈpɒzətɪv]	positiivne	положительный
possibility [pɒsəˈbɪlɪti]	võimalus	возможность
possible [ˈpɒsəbl]	võimalik	возможный
pot [pɒt]	pett, kruus	горшок, кружка
potential [pəˈtenʃəl]	võimalus; potent- siaal; potentsiaal- ne, võimalik	возможность; потен- циал; потенциальный, возможный
pottery [ˈpɒtəri]	savinõud, keraamika	глиняные изделия, керамика

power [ˈpaʊə]	võim, võimsus; jõud, mehaaniline energia	сила, мощность, энергия
powerful [ˈpaʊəfʊl]	võimas, tugev	мощный, сильный
power-station [ˈpaʊəsteɪʃən]	(elektri-)jõujaam	силовая станция, электростанция
practical [ˈpræktɪkəl]	praktiline, otstarbekohane	практический, целесообразный
practice [ˈpræktɪs]	praktika	практика
in practice	tegelikkuses	на практике, на деле
pre- [pri:]	enne-, ette-, eel-, pre-	до-, пред-, заранее
pre-amplifier [ˈpri:æmplifaɪə]	eelvõimendaja	предварительный усилитель
precision [priˈsi:ʒən]	täpsus	точность, четкость
prediction [priˈdɪkʃən]	ennustus, ettekuulutus	предсказание, прогноз
prefabricate [ˈpri:ˈfæbrɪkeɪt]	eelnevalt töötleva	изготавливать заранее
prefabrication [ˈpri:ˈfæbrɪˈkeɪʃən]	eelnev töötlemine	изготовление заранее
present [ˈpreznt]	olevik, käesolev aeg; juuresolev, kaesolev, praegune	настоящее время; присутствующий, настоящий, современный
at present	käesoleval hetkel (ajal)	в настоящее время
present [priˈzent]	esitama, pakkuma, andma	подавать, представлять
presidium [priˈsɪdɪəm]	presiidium	президиум
pressure [ˈpreʃə]	surve, rõhk	давление, сжатие
prevalent [ˈprevələnt]	ülekaalus olev, uldiselt valitsev	распространенный, преобладающий
prevent [priˈvent]	vältima, tõkestama	предотвращать, не допускать
previous [ˈpri:vɪəs]	eelmine, eelnev	предыдущий, предшествующий

primary [ˈpraɪməri]	esmane, primaarne; põhiline; tähtsaim; alg-	первоначальный; основной; главный; важнейший
principle [ˈprɪnsəpl]	printsiiip, põhimõte	принцип
in principle	põhimõttelt	в принципе
priority [praɪˈɔːrɪti]	prioriteet, eelis- õigus	приоритет, порядок очередности
prize [praɪz]	auhind, preemia	приз, премия
probably [ˈprɒbəbli]	tõenäoliselt, ar- vatavasti	вероятно
probe [praʊb]	sond; sondeerimine, uurimine	зонд; зондирование, расследование
procedure [prəˈsiːdʒə]	toimimisviis, menet- lus, protseduur	образ действия, тех- нологический процесс, процедура
process [ˈprəʊses]	protsess, menetlus; menetlema, tootlema, labi tootama	процесс, способ; под- вергать процессу, обрабатывать
produce [prəˈdʒuːs]	esile tooma; teki- tama; tootma	производить; созда- вать; вызывать
product [ˈprɒdʌkt]	toode, saadus; too- dang	продукт, изделие; продукция
production [prəˈdʌkʃən]	toodang, produktsi- oon, tootmine	производство, про- дукция
programme, prog- ram [ˈprəʊgræm]	programm, kava; prog- rammeerima	программа, план; программировать
progress [ˈprəʊgres]	edusammud, progress, areng	успехи, прогресс, развитие
project [ˈprɒdʒekt]	kavand, plaan, projekt; uusehitus	проект, план; новостройка
project [ˈprɒdʒekt]	kavandama, plaanitsema, projekteerima	проектировать, составлять проект, обдумывать план
propel [prəˈpel]	edasi ajama või lük- kama, liikuma panema	продвигать вперед, приводить в движе- ние
proper [ˈprɒpə]	oma, enda; õige, sobiv, tõeline, päris	присущий, свойст- венный; подходящий, настоящий, собственный
property [ˈprɒpəti]	omadus	свойство, качество

propulsion [prə'pʌlʃən]	edasiliikumine; liikumapanev jõud	продвижение, движущая сила
propylene [prɒ'pi'li:n]	propüleen	пропилен
proton [prəʊ'tɒn]	prooton	протон
prove [pru:v]	tõestama, tõendama; osutama	доказывать, удосто- верять; оказываться
provide [prə'vaɪd]	ette nägema või valmistama; (tingimusena) ette maarama; varustama; hoolitsema	заготавливать, снаб- жать; обеспечивать; оставлять; ставить условием
provided [prə'vaɪdɪd]	eeldusel, et, tingimusel, et	при условии, если только
publish [ˈpʌblɪʃ]	trükkis avaldama, välja andma	издавать, опубликовывать
pulse [pʌls]	pulss	пульс
pump [pʌmp]	pump; pumprama	насос; работать насосом, качать
pure [pjʊə]	puhas, segamatu	чистый, беспримесный
purpose [ˈpɜ:pəs]	eesmärk, otstarve; kavatsus	намерение, цель
put [pʊt](put, put) put together	panema kokku seadma, mon- teerima	класть, положить соединять, собирать

Q

quality [ˈkwɒləti]	kvaliteet, omadus	качество, свойство
quantity [ˈkwɒntəti]	kogus, hulk	количество

R

radar [ˈreɪdər]	raadiolokaator, radar	радиолокатор, радар
radiation [reɪdɪ'eɪʃən]	kiirgus	излучение
radio-active [ˈreɪdɪəʊ'æktɪv]	radioaktiivne	радиоактивный

raise [reiz]	tõstma	поднимать
range [reindʒ]	rida; ulatus, tegevuspiirkond; reastama, ulatuma	предел, радиус действия; сфера, зона; выстраивать в ряд, простирается, тянуться
rank [rɒŋk]	reastama; asetuma	строить в шеренгу; занимать какое-либо место
rapid [ˈræpid]	kiire	быстрый, скорый
rate [reit]	määr: kiirus, tempo	норма; темп, скорость
raw [rɔ:]	toores	сырой
raw material	tooraine, toormaterjal	сырье
ray [rei]	kiir	луч
rayon [ˈreiɔn]	kunstiid	искусственный шелк
razor [ˈreizə]	habemenuga	бритва
razor blade	šiletitera	лезвие
re- [ri:]	uesti-, taas-, ümber	снова, занова, еще раз, пере-
reach [ri:tʃ]	ulatuma, kuhugi jõudma	достигать, доходить
reaction [riˈʌksən]	reaktsioon: reageerimine	реакция, реагирование
reactor [riːˈæktə]	reaktor	реактор
ready [ˈredi]	valmis, käepärane	готовый
reasonable [riːznəbl]	mõistlik, mõõdukas, vastuvõetav	разумный, умеренный, приемлемый
recall [riˈkɔ:l]	tagasi kutsuma: meenutama	призывать обратно; вспоминать, напоминать
receive [riˈsi:v]	vastu võtma; saada	принимать; получать
receiver [riˈsi:və]	saaja; vastuvõtja; raadiovastuvõtja	получатель; (радио-) приемник
recent [riːsnt]	äsjane, hiljutine, viimane	недавний, последний
recently [riːsntli]	hiljuti	недавно

recharge [ri:'tʃɑ:dʒ]	uesti laadima	повторно заряжать
recognize [rekə'gnaiz]	ära tundma: tunnustama	узнавать; признавать
reconnaissance [ri kɔ'nisəns]	teadete kogumine, luurekaik	разведка, рекогносцировать
record [rekɔ:d]	üleštähendus; heliplaat; rekord	запись; граммофонная пластинка; рекорд
set a record	rekordit püstitama	поставить рекорд
record [ri'kɔ:d]	üles märkima, registreerima	записывать, регистрировать
record changer [rekɔ:d'tʃeindʒə]	seadeldis heliplaati- de automaatseks vahetamiseks	устройство для автоматической смены пластинок
recorder [ri'kɔ:də]	ülesmärkija, registreeriv aparaat	регистрирующий, самопишущий прибор
redesign [ri:'di'zain]	ümber konstrueerima	переконструировать
reduce [ri'dju:s]	vähendada, alandama	уменьшать, понижать
reduction [ri'dʌkʃən]	vähendus, alandus	уменьшение, снижение
refinery [ri'fainəri]	puhastusvabrik, rafineerimisvabrik	очистительный завод, рафинировочный завод
reflect [ri'flekt]	peegeldama, kajastama	отражать
reflection [ri'flekʃən]	peegeldus	отражение
refrigerator [ri'fridʒəreitə]	külmutuskapp	холодильник
refuel [ri:'fjuəl]	kütusega varustama	заправляться горючим или топливом
regard [ri'gɑ:d]	vaatlema: arvestama	смотреть на; считаться, рассматривать
regard as	(millekski) pidama	считать
regenerative [ri'dʒenə'reitiv]	regeneratiivne	регенеративный
related [ri'leitid]	ühenduses olev; suguluses olev	связанный; родственный
relative [relə'tiv]	suhteline, relatiivne	относительный, сравнительный

relay [ri 'lei]	relee	реле
reliability [ri laiə 'biliti]	usaldatavus, usal- dusvaarsus	надежность, достоверность
reliable [ri 'laiəbl]	usaldatav, usaldus- vaarne	надежный, достоверный
remain [ri 'meɪn]	jääma	оставаться
remarkable [ri 'mɑ:kəbl]	tähelepanuväärne, silmapaistev	замечательный, выдающийся
removal [ri 'mu:vəl]	kõrvaldamine, eemal- damine	удаление, устранение
remove [ri 'mu:v]	kõrvaldama, eemal- dama	устранять, удалять
render ['rendə]	andma, esitama; te- gema, muutma	воздавать, представлять; делать превращать
repeatedly [ri 'pi:tɪdli]	korduvalt	повторно
repetitive [ri 'petitiv]	korduv	повторный
replace [ri 'pleɪs]	asendada	заменять
reply [ri 'plai]	vastama	отвечать
report [ri 'pɔ:t]	teatama, ette kand- ma, aru andma; teade, ettekanne, aruanne	сообщать, доклады- вать, представлять отчет; отчет, сообщение, доклад
reproducer [ri:prə 'dju:sə]	reproduktor	воспроизводитель, репродуктор
reproduction [ri:prə 'dʌkʃən]	taastamine, repro- dutseerimine, jäljend, reproduktatsioon	воспроизведение, копия, репродукция
request [ri 'kwɛst]	paluma; nõudma	просить; запрашивать
require [ri 'kwaɪə]	nõudma; vajama	требовать; нуждаться
requirement [ri 'kwaɪəmənt]	nõue; vajadus	требование; нужда
research [ri 'sɜ:tʃ]	uurimus, teaduslik uurimine	изучение, (научное) исследование
researcher [ri 'sɜ:tʃə]	uurija	исследование
reserve [ri 'zɜ:v]	varu, tagavara	запас, резерв

resident [ˈrezidənt]	(alatiselt) elav, kohalviibiv; alatine elanik	проживающий, постоян- но живущий, постоян- ный житель
resistance [riˈzistəns]	vastupanu; takistus	сопротивление
resolution power = [rezəˈluːʃən]	(mikroskoobi) lahutus- võime	разрешающая способ- ность (микроскопа)
resolving power [riˈzɔlviŋ]		
respect [risˈpekt]	austus, respekt: su- he; üksikasi, punkt	уважение; отношение; касательство
in respect of	suhtes	что касается
in all respects	igas suhtes	во всех отношениях
result [riˈzʌlt]	tulenema, järeldu- ma, tulemusena või järelalusena andma; tulemus, järeldus, resultaat	следовать, происхо- дить в результате, кончатся результа- том; результат, ис- ход, следствие
as a result	tulemusena	в результате
retreat [riˈtri:t]	taanduma, eemalduma	отходить, удаляться
return [riˈtɜ:n]	tagasi tulema või minema; tagastama, tagasi tooma või viima	возвращать;  возвращаться
reverse [riˈvɜ:s]	überpööratud, vastu- pidine, vastas-, taga-	перевернутый, противоположный
revolutionize [revəˈluːʃnaiz]	revolutsioneerima, põhjalikku pööret te- kitama	революционизировать, производить корен- ную ломку
ring [riŋ]	ring, rõngas, võru	кольцо, круг, обруч
electric (gas) ring	elektri-(gaasi-) pliidi rõngas	кольцо электриче- ской (газовой) плиты
robot [ˈrɒbət]	robot	робот
rock [rɒk]	kalju, kivim, kalju- rahn	скала, утес
rock fill [rɒkˈfil]	kivitamm (-tammi), kivimpuiste	каменная насыпь, породная засыпка
rocket [ˈrɒkit]	rakett	ракета
rotate [rouˈteit]	tjirlema, pöörlema; pöörama, keerutama	вращать(ся)
roughly [ˈrʌfli]	karedalt; ligikaud- selt, umbes	неровно; приближи- тельно, около

route [rú:t]	tee, liikumistee; marsruut	маршрут, курс; путь, дорога
rubber [ˈrʌbə]	kummi	резина
ruby [ˈru:bi]	rubiin	рубин
run [rʌn] (ran [ræn], run) run up	jooksma, (masina koh- ta) käima käivitama; juhtima	бегать, работать (о машине), действовать пускать; управлять, вести
running [ˈrʌniŋ]	jooks: käik, (masi- na)töö: (masina) eks- pluateerimine	бег; ход, работа (машины); эксплуатация(машины)
rush-hours [ˈrʌʃaʊəz]	tippkoormuse tunnid	часы пик

S

safe [seif]	vigastamata, terve; ohutu: kindel	невредимый, сохран- ный; безопасный, надежный
safety [ˈseifti]	ohutus: kindlus	безопасность; сохран- ность
sail [seil]	puri	парус
sand [sænd]	liiv	песок
satellite [ˈsætəlaɪt]	satelliit, planeedi kaaslane	спутник, сателлит
satisfactory [ˈsætɪsˈfæktəri]	rahuldav	удовлетворительный
Saturn [ˈsætən]	Saturn (planeet)	Сатурн (планета)
scale [skeil] on a small scale	skaala, mõõtkava, ulatus väikses ulatuses	шкала, масштаб, размер в маленьком масштабе
schedule [ˈʃedju:l]	sõiduplaan, tabel, graafik	расписание, таблица, график
scheme [ski:m]	skeem, kava: süsteem	план, схема, систе- ма
science [ˈsaɪəns]	teadus	наука
scour [ˈskauə]	nõhkima, puhtaks hõõruma	чистить, отчищать
seal [si:l]	pitseerima; hermeetil- iselt sulgema, iso- leerima	ставить печать; гер- метически закрывать, изолировать

seaplane [ˈsi:pleɪn]	vesilennuk	гидросамолет
section [ˈsekʃən]	sektsioon; lõik; osa; osakond	секция; часть; отрезок; отдел
sector [ˈsektə]	sektor	сектор
seek [si:k] (sought [sɔ:t], sought)	otsima, taotlema	искать, добиваться
seem [si:m]	näima	казаться
seepage [ˈsi:pi:dʒ]	väljanõrgumine, immitsemine	просачивание, фильтрация
self-control [ˈselfkənˈtrəʊl]	enesevalitsus	самообладание
sensitive [ˈsensitiv]	tundlik	чувствительный
sensor [ˈsensə]	tajur, valgusele- ment, andur	чувствительный элемент, воспринима- ющий элемент, датчик
separate [ˈsepəreɪt]	eraldama, lahuta- ma	отделять (ся), разде- лять (ся)
separation [sepəˈreiʃən]	eraldamine, lahu- tamine, eraldumine	отделение, разделение
series [ˈsiəri:z]	seeria, rida	серия, ряд
service [ˈsɜ:vis]	teenistus	служба
services	teenuseseadmed	служебные устройства
set [set] (set, set)	panema, asetama	ставить, класть
set out	teele asuma	отправиться
set [set]	kogum; komplekt, garnituur	набор, комплект, гарнитур
several [ˈsevrəl]	mitmed, mõned, mi- tu	несколько
sew [sou] (-ed, sewn [soun])	õmblema	шить
sewing-machine [ˈsouɪnɪnəʃi:n]	õmblusmasin	швейная машина
shaft [ʃɑ:ft]	vars; võll	ручка; вал
shape [ʃeɪp]	kuju, vorm; kujun- dama, vormima	форма, вид, образ; создавать, придавать форму
sheet [ʃi:t]	voodilina; õhuke plaat, leht	простыня; лист, листок

shield [ʃi:ld]	kilp: varjama, kaitsma	щит, защищать
short = short circuit		
short circuit [ˈʃɔ:t sɔ:kit]	lühihüendus, lühis	короткое замыкание
shot [ʃɔt]	lask: vise, (raketi, kosmoselaeva) valja- saatmine	выстрел; запуск
side [said]	kül, pool	сторона, бок, край
sieve [siv]	sôel	сито
sign [sain]	märk, tunnusmärk	знак, признак
signal [ˈsignl]	signaal	сигнал
similar [ˈsimilə] (to)	sarnane (millegagi)	подобный
simplicity [simˈplisiti]	lihtsus	простота
simplification [ˌsimplifiˈkeiʃən]	lihtsustamine	упрощение
simultaneous [siməlˈteinjəs]	üheaegne	одновременный
since [sins]	mingist ajast saadik; sest ajast peale kui; kuna; sest ajast peale	с, после; с тех пор как; так как; с тех пор
single [ˈsiŋgl]	üksik, ainus, ühele maaratud	один, предназначен- ный для одного
single-shaft [ˈsiŋglˈʃɑ:ft]	ühevõlliline	одновальный
sink [siŋk]	kraanikauss, reovee- valamu	раковина, сточная труба
site [sait]	asukoht; ehituskruunt	местонахождение, место- положение, участок (для строительства)
situation [sitjuˈeiʃən]	asend, olukord, situ- atsioon	положение, состояние, ситуация
size [saiz]	suurus, mõõt	величина, размер
sketch [sketʃ]	skits, visand, kavand	эскиз, набросок, кроки
skin [skin]	nahk	кожа, шкура
skull [skʌl]	kolju, pealuu	череп

slave [sleiv]	õri	раб
slice [slais]	viilukas, lõik, õhuke kiht	ломтик, ломоть, тонкий слой
smoker [ˈsmoukɔ]	suitsetaja	курильщик
soar [sɔ:]	kõrgel lendama, hõljuma; (tavalisest tasemest kõrgemale) tõusma	высоко летать, подниматься вверх; подниматься (выше обычного уровня)
so-called [ˈsouˈkɔ:ld]	nõndanimetatud	так называемый
society [sɔˈsaɪəti]	ühiskond, seltskond; ühing	общество
solar [ˈsoulə]	päikese-, solaar-	солнечный
solar system	päikese süsteem	солнечная система
solar cell	päikeseelement	солнечный элемент
sole [soul]	ainus	единственный
solid [ˈsɒlið]	tahke, kõva; massiivne, tugev	твёрдый; массивный, крепкий
solution [sɔˈlu:ʃən]	lahendus; lahus	решение; раствор
solve [sɒlv]	lahendada	решать
some [sʌm]	mõni, mõned, veidi; umbes	некий, некоторый, несколько, около
sound [saund]	hää, heli; kõla	звук, шум
source [sɔ:s]	allikas	исток
space [speis]	ruum; maailmaruum, kosmos	пространство, космос
spacecraft [ˈspeiskrɑ:ft]	kosmoselaev, kosmoselaevad	космический корабль, космические корабли
space rocket (space-rocket) [ˈspeisˈrɔkit]	kosmoserakett	космическая ракета
spaceship [ˈspeisʃip]	kosmoselaev	космический корабль
special [ˈspeʃəl]	eriline, spetsiaalne	специальный, особый
spectrum [ˈspektrəm]	spekter	спектр

speed [spi:d]	kiirus	скорость, быстрота
staff [sta:f]	töötajaskond, personal	штат служащих, служебный персонал
stage [steidʒ]	järk, aste	фаза, этап, ступень
stair [stɛə]	trepiaste	ступенька (лестницы)
stairs	trepp	лестница
stand for	kujutama, tähendama	символизировать, означать
stand out	välja ulatuma, silma paistma	выделяться, выступать
start [stɑ:t]	teeleasumine; algus; käivitus, käikulaskmine; teele asuma; alustama; käivitama, käiku laskma	отправление, начало; начинать; пуск в ход; отправляться; пускать (машину)
start-up	käikulaskmine	пуск в ход
state [steit]	seisund; teatama, väitma	состояние; заявлять, утверждать
steady [ˈstedi]	püsiv, muutumatu	постоянный, неизменный
steam [sti:m]	aur; auru-	пар; паровой
step [step]	aste, samm	шаг
in step	ühte sammu; vastavalt	в ногу; соответственно
take steps	samme astuma	принимать меры
stereo- [ˈstiəriu]	keha-, ruumi-, stereo	стерео-
stereo control panel	stereokontrollpult	стереоконтрольная панель
stereo tuner, [ˈstiəriu tju:nə]	stereomuundaja	стереофический преобразователь
stimulate [ˈstimjuleit]	ergutama, stimuleerima; ergastama	возбуждать, стимулировать, побуждать
storage [ˈstɔridʒ]	ladustamine; (kauba) laoruum; kulmutusruumis säilitamine	хранение; хранилище; хранение в холодильнике
store [stɔ:]	varu, ladu; varuma, tagavaraks koguma	запас, склад; снабжать, запасать
straight [streit]	sirge, otse-; otse, sirgelt	прямой; прямо

Strasbourg [ˈstræzbə:g]	Strasbourg	Страсбург
stream [stri:m] on stream	vool; oja, jõgi käigus, käiku	поток; ручей; река запущен, в ход
structural [ˈstrʌktʃərəl]	struktuuriline, struktuur-, ehitus-	структурный, строительный
study [ˈstʌdi]	õping, uurimus, uurimine, stuudium; õppima, uurima	изучение, исследование; изучать, исследовать
submarine [ˈsʌbməri:n]	allveelaev	подводная лодка
substance [ˈsʌbstəns]	substants, aine	вещество, материя
substantial [səbˈstʃʌl]	oluline, tunduv	существенный, значительный
subway [ˈsʌbwei]	(Am.) allmaaraudtee, metroo	(Амер.) метро
succeed [səkˈsi:d]	järgnema; edu saa- vutama (in)	следовать; преуспевать
suggest [səˈdʒest]	sisendada; ette pa- nema, soovitama; tähendama	внушать, предлагать, советовать, означать
suicide [ˈsjuisaɪd]	enesetapmine	самоубийство
suit [sju:t]	sobitama, kohandama, sobima	устраивать, приспособлять, подходить
suitable [ˈsju:təbl]	sobiv, kohane	подходящий, соответствующий
sulphuric acid [ˈsʌlˈfju:ərɪk ˈæsid]	väävelhape	серная кислота
sunlight [ˈsʌnlait]	päikesevalgus	солнечный свет
super- [ˈsju:pə] super speed	üle-, peal-, üli- ülikiire	над-, сверх- сверхскоростной
superconducting [ˈsju:pəkənˈdʌktɪŋ]	ülijuhtiv	сверхпроводящий
superconductive [ˈsju:pəkənˈdʌktɪv]	ülijuhtiv	сверхпроводящий

superconductivity [ˈsju:pəkɔndʌkˈti- viti]	ülijuhtivus	сверхпроводимость
superior [ˈsju:ˈpiəriə](to)	ülem, üleolev, parem	высший, лучше, лучший
superphosphate [ˈsju:pəˈfɔsfeit]	superfosfaat	суперфосфат
supersonic [ˈsju:pəˈsɒnik]	helikiirust ületav	сверхзвуковой
supply [səˈplai]	varustama; hanki- ma: (vajadust) ra- huldama; andma (voolu)	снабжение; запас; снабжать; поставлять, удовлетворять (нуж- ду); подавать (ток)
suppose [səˈpəuz]	oletama, arvama, eeldama	предполагать, полагать, допускать, думать
surface [ˈsɜ:fis]	pind (pinna)	поверхность
surgical [ˈsɜ:dʒikəl]	kirurgiline	хирургический
surpass [sɜ:ˈpɑ:s]	ületama	превосходить
survey [ˈsɜ:vei]	vaatlus, ülevaade	обозрение, обзор
sweep [swi:p] (swept [swept], swept)	pühkima	мести, подметать
switch [switʃ]	lülitama	
switch on	sisse lülitama	включать
switch over	üMBER lülitama	переключать
switch to	(millelegi) üMBER lülitama või lülitu- ma	переключать(ся) на
synthesis [ˈsɪnθiːsɪs] (pl. syntheses [ˈsɪnθiːsɪz])	süntees, süntee- simine	синтез
synthetic [ˈsɪnˈθetik]	sünteesiline, kunst- lik	синтетический, искусственный
system [ˈsɪstɪm]	süsteem	система

take [teik] (took [tuk], taken [teikən])	võtma	брать, взять
take in	sisse võtma, vastu võtma	принимать внутрь, принимать
tap [tʰp]	kraan	кран
tape [teip]	lint; lindistama	лента; записывать на магнитную ленту
tape-recorder [teipriksidə]	magnetofon	магнитофон
target [tɑ:git]	märklaud	цель, мишень
task [tɑ:sk]	(töö)ülesanne	задача, задание
technical [teknikəl]	tehniline	технический
technically [teknikəli]	tehniliselt	технически
technology [tek'nɔlədʒi]	tehnika; tehnoloogia	техника; технология
television [telivizən]	televisioon	телевидение
television receiver	televiisor	телевизор
television set	televiisor	телевизор
temperature [temprits]	temperatuur	температура
terylene [terili:n]	lavsaan.	лавсан
test [test]	katse, proov; katsetama, proovima	испытание; подвергать испытанию, проводить опыты
theoretical [θiə'retikəl]	teoreetiline	теоретический
theory [θiəri]	teooria	теория
thermal [θɜ:məl]	termiline, soojus-	термический; тепловой
thin [θin]	õhuke, peenike, kõhn	тонкий, худой

thread [θred]	niit, lõng	нитка, нить
throughout [θru:ˈaut]	läbi kogu (millegi), kõikjal, kogu	через, по всему
throughout this period	kogu selle perioodi kestel	через весь этот период
Tien Shan [ˈtiənʃɑ:n]	Tjan-San	Тянь-Шань
timer [ˈtaimə]	aegrelee	реле времени
timetable [ˈtaimteibl]	tunniplaan, sõidu- plaan	расписание
tiny [ˈtaini]	tilluke, pisike	очень маленький, крошечный
tissue [ˈtisju:]	kude	ткань
toil [tɔil]	raske töö	тяжелый труд
ton [tʌn]	tonn	тонна
tool [tu:l]	tööriist, vahend	рабочий инструмент, орудие
torrent [ˈtɔrənt]	äge vool	стремительный поток
total [ˈtəʊtl]	täielik, kogu; ko- gusumma, koguhulk	весь, целый; полный; целое, сумма
touch [tʌʃ]	puudutus, kokku- puude; kimpimine; puutuma, puudutama	прикосновение, соприкосновение; осязание; касаться, трогать
track [træk]	jalg; magnetofoni- lindi salvestusri- ba; jälitama, jäl- gima	след; звуковая до- рожка; следить, выслеживать
traction [ˈtrækʃən]	vedamine, vedu	тяга, волочение
traction motor	veomootor	тяговый двигатель
trade [treid]	elukutse, käsitöö; kaubandus	профессия, ремесло; торговля
traditional [trəˈdiʃənəl]	traditsiooniline	традиционный
traffic [ˈtræfɪk]	liiklus	движение
traffic lights	valgusfoor	светофор
train [trein]	rong; rida (sündmu- si, mõtteid)	поезд; цепь, ряд (событий, мыслей)
wave train	seeria laineid	серия волн

training [ˈtreiniŋ]	väljaõpe, treening	обучение, тренировка
transfer [ˈtrænsˈfɜː]	üle viima, üle kandma	переносить, перемещать
transmission [ˈtrænzˈmiʃən]	ülekanne, transmissioon	передача, трансмиссия
transmit [ˈtrænzˈmit]	üle kandma; edasi andma, edasi saatma	передавать, отправлять, посылать
transpire [ˈtrænzˈpaɪə]	teatavaks saama	становиться известным
transport [ˈtrænsˈpɔːt]	transport; reisi- või postilennuk	транспорт; пассажирский или почтовый самолет
travel [ˈtrævəl]	reis, tšekond; reisisima, randama, liikuma, levima	путешествие; путешествовать, двигаться, распространяться
treble [ˈtrebl]	kolmekordistama, kolmekordistuma	устраиваться
trend [ˈtrend]	kallak, suund, hoiak	направление, тенденция
Trieste [triːˈest]	Triest	Триест
trough [ˈtrɒf]	laineorg	подшва волны
tube [tjuːb]	toru	труба
tumour [ˈtjuːmə]	kasvaja	опухоль
tuner [ˈtjuːnə]	(raadioaparaadi) häälestusseadis	устройство для настройки
tungsten [ˈtʌŋstən]	volfram	вольфрам
tunnel [ˈtʌnl]	tunnel	туннель
turbine [ˈtɜːbiːn]	turbiin	турбина
turbo-generator [ˈtɜːbouˈdʒenəreɪtə]	turbogeneraator	турбогенератор
turn [tɜːn]	pöörama, pöörduma, keerama, poorlema	вращать(ся), поворачивать(ся), обра- щаться
turn off	(kraani) kinni kee- rama; välja lülita- ma	закрывать (кран); вы- ключать
turn on	(kraani) lahti kee- rama; sisse lülitama	открывать (кран), включать
turn out	osutama	оказываться

twice [twais]	kaks korda	дважды, вдвое
twin [twin]	kaksik; kaksik-, kahekordne	двойник; двойной, сдвоенный
twins	kaksikud	двойня
type [taip]	tüüp	тип

U

Ukraine, the [ju: 'krein]	Ukraina	Украина
ultrasonic [ʌltrə'sɒnik]	helikiirust ületav	сверхзвуковой
ultrasonics [ʌltrə'sɒniks]	ultraakustika, ultraheli	ультраакустика, ультразвук
unaffected [ʌnə'fektid] (by)	mõjutamata (millest-ki)	не тронутый, не затронутый (чем-либо)
unbreakable [ʌn'breikəbl]	purunematu	неломкий
unconventional [ʌnkən'venʃənl]	ebakonventsionaalne, ebatavaline	чуждый условности, нешаблонный
undoubtedly [ʌn'daʊtɪdli]	kahtlemata	несомненно, бесспорно
uniformity [ju:ni 'fɔ:miti]	ühetaolisus, ühtlus	единообразие, равномерность
unique [ju: 'ni:k]	ainulaadne, unikaalne	единственный в своем роде, уникальный
unit [ju:ni:t]	ühik, üksus; agregaat, sektsioon, element	единица; агрегат, секция, элемент
United Kingdom [ju: 'naitid 'kɪŋdəm]	Ühendatud Kuningriik (Suurbritannia ja Põhja-Iirimaa)	Соединенное Королевство (Великобритания и Северная Ирландия)
unlikely [ʌn 'laikli]	ebatõenäoline	маловероятный
unnecessary [ʌn 'nesisəri]	mittevajalik, tarbetu	ненужный, излишний
up to	kuni	до
upper [ʌpə]	ülemine, pealmine, üla-	верхний; высший

upright [ʌpraɪt]	püstine, vertikaalne	прямой, вертикаль- ный
Uranus [ˈjuərənəs]	Uraan (planeet)	Уран (планета)
urea [ˈjuəriə]	karbamiid	мочевина
use [ju:s]	tarvitamine, kasuta- mine	употребление, исполь- зование
make use of	ära kasutama	использовать, вос- пользоваться

V

vacuum [ˈvækjuəm]	vaakuum	вакуум
vacuum cleaner [ˈvækjuəm ˈkli:nə]	tolmuimeja	пылесос
valley [ˈvæli]	org	долина
value [ˈvælju:]	väärtus	ценность, величина
variety [və ˈraɪəti] (of)	mitmekesisus; mit- mekesine valik, palju	разнообразие; ряд, множество
various [ˈvɛəriəs]	mitmekesine, mit- mesugused, eri-	различный, разный, разные
vast [vɑ:st]	tohutu, määratu	обширный, громадный
vehicle [ˈvi:ɪkl]	sõiduk	перевозочное средст- во
Venus [ˈvi:nəs]	Veenus (planeet)	Венера (планета)
very [ˈveri]	tõeline, päris; just see; kõige	истинный, сущий; самый
vessel [ˈvesl]	anum; laev	сосуд; судно
via [ˈvaiə]	teed, kaudu	через
vice-president [ˈvaɪs ˈprezɪdənt]	asepresident	вице-президент, заместитель президента
vicinity [vi ˈsɪnɪti]	naabus, lähedus	соседство, близость
videotape [ˈvɪdɪəuteɪp]	magnetlint televi- sioonikujutiste üles- markimiseks	магнитная лента для записи телевизион- ных изображений
vidicon [ˈvɪdɪkən]	vidikon (televisioo- ni saatetoru fotota- kistiga)	видикон (телевизион- ная трубка с фото- сопротивлением)
view [vju:]	vaatlema, vaatama	осматривать, рассмат- ривать

violent	[ˈvaiələnt]	vägivaldne	НАСИЛЬСТВЕННЫЙ
viscose	[ˈviskɔs]	viskoos	ВИСКОЗА
visible	[ˈvizəbl]	nähtav	ВИДИМЫЙ
vision	[ˈviʒən]	nägemine, nähtavus	ЗРЕНИЕ, ВИДЕНИЕ
volume	[ˈvɔljum]	ruumala; kogus, hulk	ЕМКОСТЬ; ОБЪЕМ, МАССА

W

Warsaw	[ˈwɔːsɔː]	Varssavi	Варшава
washing-machine	[ˈwɔʃɪŋməʃiːn]	pesupesemismasin	стиральная машина
way	[wei]	tee; teuguviis	путь, дорога; образ действия
under way		teel, toimumas	на ходу, делается
weaken	[ˈwi:kən]	nõrgendada, nõrgenema	ослаблять, слабеть
weapon	[ˈwepən]	relv	оружие
wear	[weə] (wore [wɔː], worn [wɔːn])	kandma (riietus-esemeid)	носить (одежду)
weave	[wi:v]	kuduma	ткать
(wove [wouv], woven [wouvən])			
weekly	[ˈwi:kli]	kord nädalas	еженедельно
weigh	[wei]	kaaluma	весить
weight	[weit]	kaal, raskus	вес, тяжесть
welding	[ˈweldɪŋ]	keevitamine	сварка
well	[wel]	hästi	хорошо
as well as		samuti ka	так же как
western	[ˈwestən]	lääne	западный
whereas	[weəɪˈæz]	kuna	тогда как, поскольку
whether	[ˈweðə]	kas (kaudses küsimuses)	ли

width [widθ]	laius	ширина
win [win] (won [wʌn], won)	võitma	выиграть, победить
wind [waɪnd] (wound [waʊnd], wound)	keerlema; keerama kerima	ВИТЬСЯ; НАМАТЫВАТЬ, МОТАТЬ
wire [ˈwaɪə]	traat, juhe	проволока, провод
within [wiˈʒin]	seespool, sees	в, в пределах; внутри
work [wɜ:k]	töö; töötama	работать; работа
work at (on)	millegi kallal töö- tama	работать над чем-либо
work out	välja arvestama, väl- ja töötama	решать (задачу), раз- рабатывать, составлять
workshop [wɜ:kʃɒp]	töökoda, tsehh	мастерская, цех
wound	vt. wind	см. wind
woven	vt. weave	см. weave
wreck [rek]	laevahukk; vrakk; hä- ving; purustama, hä- vitama	крушение (корабля); остатки кораблекру- шения; гибель; вы- звать разрушение, разрушать

X

x-ray [ˈeksˈrei]	(pl.) röntgenikiired	(обычн. pl.) рент- геновские лучи
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Y

Yerevan [ˌjeriˈvɑ:n]	Jerevan	Ереван
yet [jet]	seni; ent, kuid siis- ki	до сих пор; когда- либо, однако, все же
yield [ji:ld]	tootma, andma	производить, давать

Z

zirconium [zɜ:ˈkounjəm]	tsirkoonium	цирконий
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## Lühendid

## Сокращения

A ampere [ʔampɛɔ]	amper	ампер
a.m., am amplitude modulation	amplituudi modulatsioon	амплитудная модуляция
cm centimetre [sentimi:tɔ]	sentimeeter	сантиметр
cu. cubic [kju:bik]	kuup-	кубический
DM = Deutsche Mark	(saksa k.) saksa mark	(на немецком яз.) немецкая марка
e.m.f. electromotive force [i'lektromoutiv'fɔ:s]	elektromotoorne jõud	электродвижущая сила
f.m., FM modulated frequency modulation	sageduse moduleerimisega (juhtimisega) sageduse moduleerimine (juhtimine)	с частотной модуляцией
ft foot	jalg (30,48 см)	фут (30,48 см)
hr hour	tund	час
in. inch	toll	дюйм
°K Kelvin [kelvin]	Kelvini temperatuuriskaala	температурная шкала Кельвина
kw, kW kilowatt [kilawɔt]	kilovatt	киловатт
lb. libra = pound [paund]	nael (453,6 г)	фунт (453,6 г)
m metre [mi:tɔ]	meeter	метр
mega [megɔ]	mega (10 <sup>6</sup> )	мега (10 <sup>6</sup> )
mcf, MCFD mille cubic feet per calender day	tuhat kuupjalga aeraevas	тысяча кубических футов в сутки
mm, millimetre [milimi:tɔ]	millimeeter	миллиметр
m.p.h. miles per hour	milli tunnis	миль в час

mt megaton	megatonn	мегатонна
MW, Mw megawatt	megawatt	мегаватт
pa, p.a. per annum [pär'ændäm]	aastas	в год
pvc, PVC polyvinyl- chloride	polüvinüülkloriid	полихлорвинил
sec. second	sekund	секунда
t ton	tonn	тонна
U.K. United King- dom	Ühendatud Kuning- riik	Соединенное Королев- ство
USA United States of America	Põhja-Ameerika Ühendriigid	Соединенные Штаты Америки
yd yard [ja:d]	jard (914,4 mm)	ярд (914,4 мм)

ТАЛЛИНСКИЙ ПОЛИТЕХНИЧЕСКИЙ ИНСТИТУТ  
Кафедра языков

НАУЧНО-ПОПУЛЯРНЫЕ И ТЕХНИЧЕСКИЕ ТЕКСТЫ  
ДЛЯ СТУДЕНТОВ

Vastutav toimetaja P.Vaarask

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Trükkimisele antud 18.XI 68. Paber 60x80,1/16  
Trükipg. 6,0. Tingpg. 5,58. Tiraaz 1500  
MB-10522. TPI rotaprint, Tallinn, Pikk  
jalg 14. Tell.800 . Hind 16 kop.



Hind 16 kop.

II

1A-5665

TÜ RAAMATUKOGU



1 0300 00605618 0