

All electrocardiographs have the same operating principle, but they are different in implementation and manufacturing.

The principle of voltage measurers is the main in the operation of a medical electrical cardiograph. The oscillation of the difference of potentials (occurring in the excitation of the heart muscle) is fixed by electrodes attached to the patient's body and transmitted directly to the input of the device. The movement of the band fixing the electrocardiogram is carried out at different rates and may range from 25 mm/sec to 100 mm/s. The most common rate is 50 mm/s.

Both electrocardiographs have their pros and cons. These units are similar in their parameters. The only difference is the screen size. The screen of EK3T-01-P-D is smaller and less informative, but it is manufactured in Russia. So it is easier to get constitutive elements.

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### ENERGY GENERATION OF THE VIBRATION OSCILLATIONS. ELECTROMAGNETIC GENERATORS

*Rygzynova A.C.*

National Research Tomsk Polytechnic University, Tomsk  
Scientific advisor: Ivanova V.S., Ph.D., associate professor, department of  
precision instrument making

Alternative sources of energy in the form of wind and water mills exist centuries (they are getting high-power). In recent years, a small but fast-paced development of the systems segment energy micro from the environment.

Means of gratuitous energy, as it is sometimes referred to such systems, produce virtually inexhaustible "green" sources of energy supply. As such, they contribute to solving one of the major challenges faced by designers of electronic systems, - creation of a continuously operated, if possible without batteries, the device (battery-less power). Several years ago, the idea of getting energy micro of the environment was considered a scientific curiosity. But the development of electronic systems with ultra-low power led to unexpectedly exit Energy Harvesting technology outside labs. And today among 10 major promising areas of modern electronics called Energy Harvesting technology.

Vibration generators are:

- Piezoelectric (piezo materials are used, which represent the possibility of generation of charges, when they are in a state of tension).
- Electromagnetic (based on electromagnetic induction and Lenz's law. Electromotive force is generated from the relative movement between the coil and magnet).
- The electrostatic / capacitive (capacitor is used to generate the charge of the relative motion between the two plates).[1]

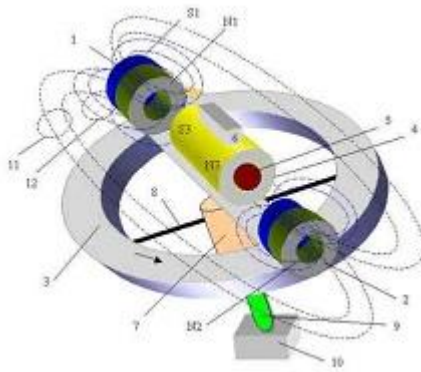
In this article we consider the electromagnetic generators.

Under present conditions, the prices of fossil fuels are increasing. In this regard, more and more attention is paid to alternative energy sources, which exist in a large number of variants. One of the examples of such sources may be electromagnetic generator.

Theoretically, electromagnetic generator produces permanent magnet excitation. The principle of operation is based on the Ampere's Law, which involves the conductor and the electric current in a magnetic field. This law is expressed by the formula:

$$F = B \cdot L \cdot I,$$

that is, the power is in direct proportion with the induction of the F, the length of the conductor L and current strength in the conductor I. Thus, the electromagnetic power generator can be increased together with the power of permanent magnets.



Pic.1 The principle of operation of the device

It can be concluded that the use of permanent magnets as an inexhaustible source of energy will create installation with an efficiency of more than 100%. However, not everything is so easy and there are a number of reasons.

#### Features of the electromagnetic generator

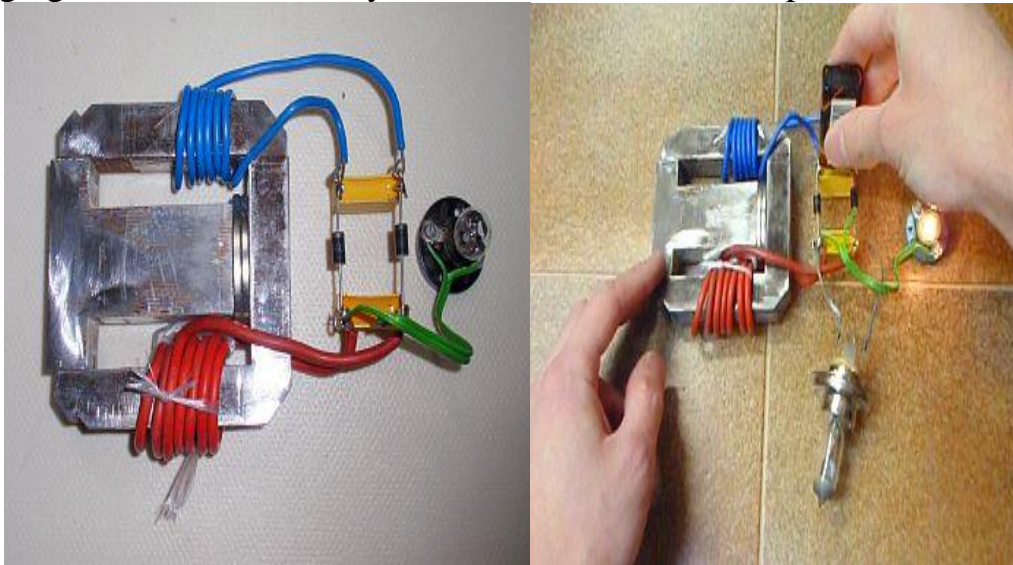
1. Permanent magnet can not be considered as an inexhaustible energy source, as it directly contradicts the law of conservation of energy. Although the magnetic field, and is not reduced in the process of doing work.

2. The permanent magnets sufficiently strong fields have appeared recently in the same way as the method by which the magnetic flux is concentrated. Without this concentration before it was impossible to create a compact power plant that was totally impractical.

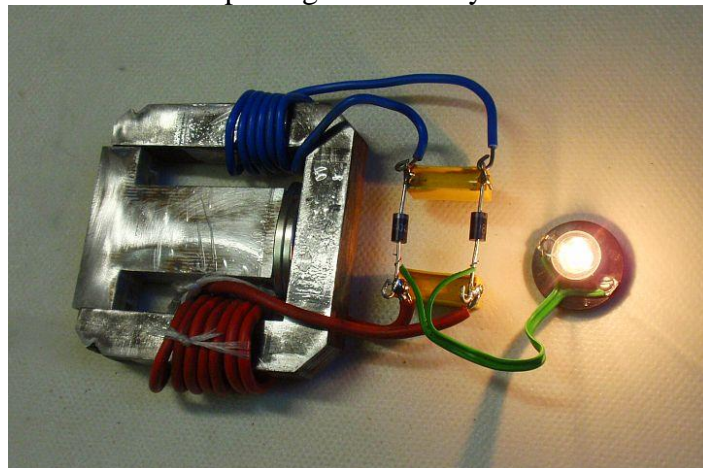
3. Previously it was thought that ferromagnetic materials can not have the properties of the magnet due to the chaotic arrangement in which magnetic charges. However, this opinion was erroneous.[3]

The basic principle is the interaction of the electromagnetic generator, created by a permanent magnet installed on the machine with the magnetic field and the one generated by the electric coil. The stationary magnetic field of the permanent magnet itself may not cause an electric current in the coil by the Lenz law. Also, an alternating magnetic field generated by the other electric coil or moving magnet can induce a current. But to move the magnet or power the another coil you need energy. Magnet does not need energy source. This is why the interaction of two magnetic fields was chosen. The magnet system consists of three major parts: a magnet, the input coil and output coil. There are two sources of magnetic field: input coil and magnet. The magnet does not consume energy, but generators do a constant magnetic field. Input coil can generate an alternating magnetic field, but it consumes energy. The solution to this problem lies in the interaction of two magnetic fields. A magnetic field coil is superimposed on the magnetic field of the magnet and its strength is added. The field strength varies as the coil

generates an alternating field. The sum of these two fields, thus is also changing, and therefore it may induce a current in the output coil.[2]



Pic.2 The Motionless electromagnetic generator (MEG) before startup and the MEG startup using a 9V battery.



Pic.3 The Motionless electromagnetic generator of free energy in operation.

It was found that the magnets from rare earth materials also have the energy and ability to attract metal objects. However, by itself the magnetic energy may not work for this purpose it must be converted into mechanical energy. It is possible, if you create an electromagnetic generator, which is due to the power of permanent magnets will have a high degree of efficiency in excess of 100%. At first glance, it is contrary to all laws of physics. However, it refers to a situation where there is no external source of energy. The generator is a permanent magnet used as an external energy source.[4]

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## POSSIBLE SOLUTIONS OF THE PROBLEM WITH SPACE DEBRIS

*Nekhoroshev A.V., Samatov T.K.*

*Tomsk Polytechnic University, Tomsk*

*Scientific supervisor: Kosheleva E.Y. PhD in History, associate professor,  
Department of Foreign Languages, Institute of physics and technology*

The aim of this work is to talk about the problem of pollution of the Earth's orbit with space junk and about the possibilities of its purification.

With half a million pieces of space debris cluttering Earth's orbit, according to NASA, this means there is a growing problem of cluttering up our access road to space. Several companies and entities have proposed ways to get rid of derelict satellites and other space junk. In our article we suggest to pay attention to seven recent proposals, ranging from electrical currents to slingshotting for knocking debris down.

**Snagging and Moving Space Junk.** The e.DeOrbit mission – first proposed publicly in early 2014 – would seek out satellite debris in a polar orbit at an altitude between 800 and 1,000 kilometers (500 to 620 miles). The European Space Agency is considering several kinds of "capture mechanisms" to pick up the debris, such as nets, harpoons, robotic arms and tentacles.

**Pushing Debris Out of Space.** CleanSpace One, a technology demonstration spacecraft, is expected to launch in 2018 from the back of a modified Airbus A300 jumbo jet. The Swiss Space Systems satellite would then meet up with a decommissioned SwissCube nanosatellite to move it out of orbit.