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**PROBLEMS AND OPPORTUNITIES FOR INNOVATIVE  
DEVELOPMENT IN THE RADIO-ELECTRONIC REGION OF  
RUSSIA**

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**Abstract**

Electronic products accounts for a significant proportion of innovative and high-tech products in the global volume, and their amount and variety are constantly increasing. The current state of one of the leading areas, the radio-electronic industry in Russia, is analyzed in this article. There are few fundamentally new developments on the market of civilian radio-electronic products; mainly, established technologies are replicated for various fields of application. Analysis of the innovation policy of developed countries in high-tech sectors of the economy showed that the effectiveness of the chosen strategy for the innovative development of the radio-electronic industry in Russia is directly related to the results of the activities of enterprises and research and development organizations, joined by the unity of joint activities to create new models of radio-electronic equipment and new technologies for its production. In order to comprehensively consider the state of the investigated area, its strengths and weaknesses are analyzed. Despite the fact that nowadays Russia is going through hard times, the radio-electronic complex has almost completely retained its capabilities. The export of advanced types of weapon and military equipment is a clear illustration of this. The analysis made it possible to formulate the conditions as may be necessary for the effective innovative development of enterprises in the radio-electronic industry in Russia.

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*Keywords:* Government support, investment policy, innovative strategies, competitiveness, radio-electronic area



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## **1. Introduction**

The topicality of this study is due to the fact that the radio-electronic industry of our country is one of the most significant sectors of our economy. It should be noted that the industry of interest has been worked out within the framework of target-oriented tools implemented at multiple levels (industry and state).

## **2. Problem Statement**

Improving electronic products and increasing their production volume should be based on the integrated target programs that come from the government. Probably, such necessity is due to the fact that almost half of the volume is financed by the state budget.

## **3. Research Questions**

In the article the issue of the current state of the radio-electronic area in Russia is examined, as well as problems are identified and the development opportunities of this area are determined.

## **4. Purpose of the Study**

The goal of the research is to identify problems and determine the development opportunities in the radio-electronic area of Russia.

## **5. Research Methods**

In order to consider the state of the radio-electronic industry in our country, you can refer to the shorthand report of the cabinet council on the development of this industry. The cabinet council took place on March 25, 2020.

At the cabinet council, Prime Minister M. Mishustin said that the radio-electronic industry in Russia must be brought to a competitive level. This need is conditioned by the fact that, despite the fact that the radio-electronic industry is growing every year, the volume of sales of domestic electronics in the world market practically does not exceed 10% (as cited in Kasaev, 2016).

Currently, the field of radio electronics is used by the global powers as a lever whereby they can maintain dominance. What is meant here is technical, financial, political and, of course, military domination.

It is important to pay attention to the fact that in order to enter the radio-electronic field into the world competitive market, it is necessary to pay due attention to the development of state support in this area.

Improving electronic products and increasing their production volume should be based on comprehensive targeted programs that come from the government. Probably, this need is due to the fact that almost half of the volume is financed by the state budget.

For the development of electronics at the present time in the world, more than 12 billion dollars are allocated every year. Considering the fact that firms can spend about 10% of the volume in order to implement research-oriented work, the indicated amount can increase to about 30 billion dollars.

The world market of radio electronics is characterized by the following segments (Kasaev, 2016):

- The first segment is consumer electronics. This segment includes mass audio, video, computer and household appliances.
- The second segment is professional electronics. It should be noted that this segment can be used in various fields (industry, automobile production, medicine, etc.).
- The third segment is purpose-made radio electronics. This segment includes equipment designed not only for various types of weapon, but also for law enforcement agencies.

The functioning of enterprises which activities are aimed at the development of electronics is noticeably complicated for many reasons. So, among the reasons, first of all, is the very precarious financial and economic situation of radio-electronics enterprises, which was caused by low volumes of state orders. In addition, the activities of enterprises are negatively affected by untimely payment to employees, violation of various ties, for example, cooperation and technological orientation, as well as problems associated with the provision of component parts (Filippov, 2014).

That is why Russia is somewhat behind the level of development of the world market. This leads to the fact that there is a lag in the defense of our country.

It should be noted that at the present time a catastrophic personnel and technological situation has developed in the radio-electronics industry. According to statistics, the age of the employees is often over 55 years old. In connection with the outbreak of the crisis of the 90s, the younger generation (25-40 years old) was practically “knocked out” at the enterprises of the radio-electronic field. All this testifies to the fact that literally in 6-7 years there will be no one to work at radio-electronic enterprises (Batkovsky, 2018).

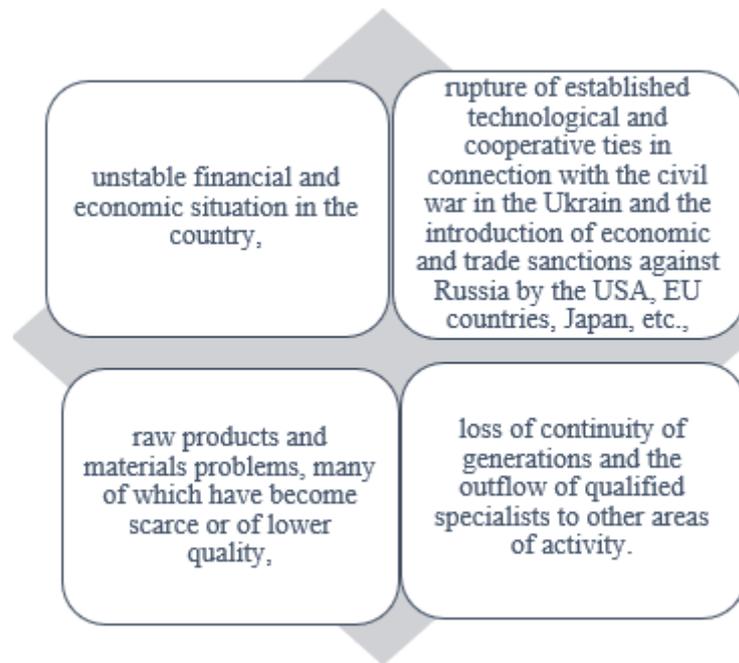
The reason for this is, first of all, the low level of salary, because young people strive to earn as much as possible. Therefore, most of the enterprises that exist today continue to effectively exist only at the expense of the Soviet scientific school. If it ceases to exist, then the technologies that allow the effective implementation of the activities of radio-electronics enterprises will also disappear irrevocably.

The system of training and retraining of workers is practically destroyed today. The activities in the radio-electronic industry, unfortunately, are not considered as prestigious as they were in Soviet times. That is why qualified and talented specialists practically do not come to work in this area (Chernikov, 2020).

The fact that our country desperately needs electronics, which will be developed at a high level, is obvious. This is caused by two problems that are closely interconnected - product quality and import substitution, since this is what determines the country's technological independence (Khokhlov, 2013).

It is noteworthy that today in radio-electronic systems (both existing and modernized), many components are used, which are imported by their origin. This adversely affects the national security of the state, since it becomes to some extent dependent on foreign suppliers.

Thus, the complication of the activities of enterprises of the radio-electronic industry is influenced by factors that can be presented in the following scheme (Kupriyanov, 2018): ( See Figure 1).



**Figure 1.** Factors complicating the functioning of enterprises of the radio-electronic industry

However, despite these problems, the radio-electronic industry of our country has significant advantages, which include the following (Kupriyanov, 2018):

- high technological potential in the field of dual and civil products;
- a combination of unique competencies;
- availability of sufficient scale to create complex products, increase efficiency, intensify use and develop technological potential.

All this contributes to the fact that the radio-electronic industry is currently developing in our country.

But, of course, the share of domestic products should be increased. Thus, in the opinion of Nikolay Plis, First Deputy General Director of Angstrom, for this purpose it is necessary to develop such measures that in some way could compensate for the costs of manufacturers to replace the imported electronic component base with a domestic one.

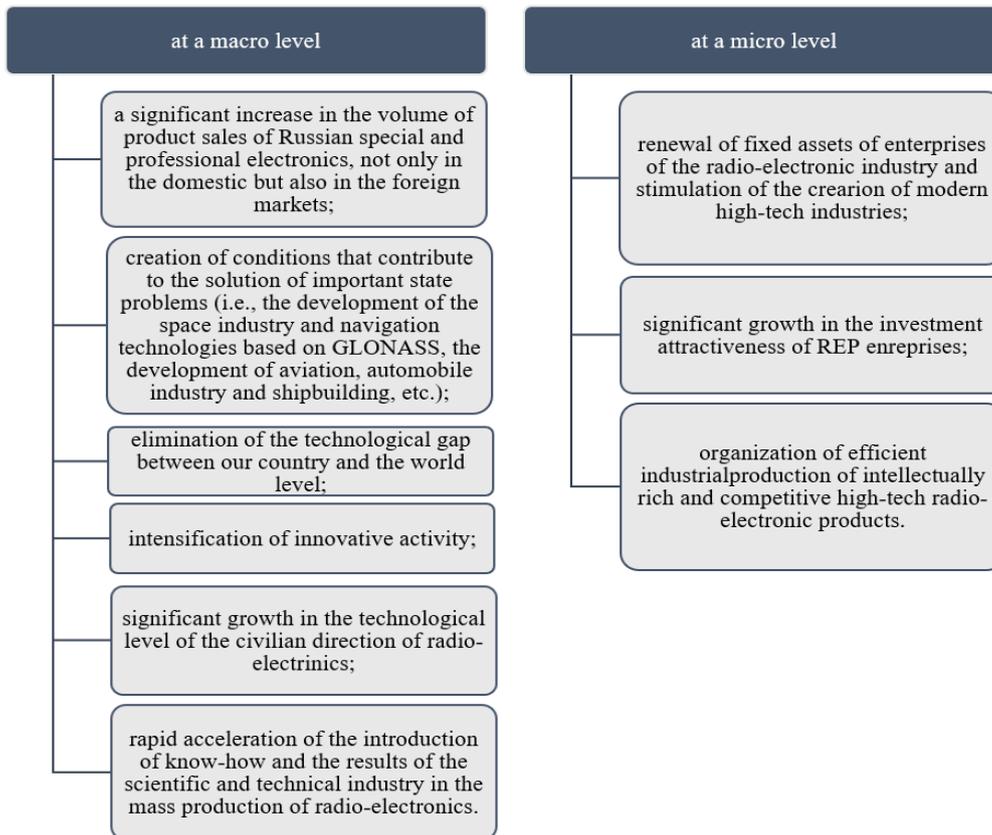
That is why it is necessary to develop a mechanism that will be aimed at regressive compensation of the costs of launching into serial production. In order to get a chance to become competitive, our country needs to compensate for some part of the cost with units of production within 3-4 years. This time will be enough for enterprises not only to renew their capacities, but also to successfully debug their production. Consequently, a decent cost of production will be ensured.

Nikolay Plis says that the rapid development of the radio-electronic industry in countries such as China and India has a very reasonable character. This is due to the fact that the named countries were able to make huge investments in the development of this industry. In addition, they received necessary political support. This made it possible to develop the necessary technologies, sales markets and qualified specialists.

That is why, according to Plis, Russia will be able to compete with these countries only if they are on an equal terms. There is no doubt that the target program method will contribute to the solution of the indicated problem. The advantage of this method is that it will help to ensure the necessary level of targeted support for the development of technologies and new industries in order to increase the level of competitiveness of the area which is considered.

It should be noted that in 2020 “Strategy for the Development of the Electronic Industry for the Period up to 2030” was approved. The main goal of the strategy is to ensure the industry’s revenue of up to 5.2 trillion rubles. To achieve this goal, the government is forced to invest heavily. So, for the next three years, 266 billion rubles were allocated for the development of the electronics industry. In addition, more than 100 billion rubles were also allocated for other purposes - the development of the Internet of things, equipment for new generation communication networks, as well as quantum sensors (Avdonin, 2016).

According to JSC CRDC“Elektronika”, the radio-electronic industry will be one of the main drivers of growth in the domestic economy in the future (Nefedov, 2016).



**Figure 2.** Results of the innovation strategy of enterprises of the radio-electronic industry at the macro- and micro-levels

Currently, our country is implementing national projects in 13 areas. And, it’s worth noting that in each of them, one way or another, radio electronics is involved, for example (Batkovsky, 2017):

- increasing the level of accessibility, as well as optimizing the work of medical institutions in the “Healthcare”;
- creation of a modern and safe digital educational environment in “Education”;
- introduction of automated and robotic technologies for organizing traffic in the project “Safe and high-quality highways”.

So, the implementation of the innovative strategy of enterprises of the radio-electronic industry at the macro level can lead to the results that are displayed in the following diagram (Figure 2).

## 6. Findings

To ensure a competitive level of development of the radio-electronic industry in our country, it is also necessary to develop a set of state support measures, the purpose of which will be economic support for domestic enterprises. Therefore, it will be advisable at the present time to focus on those sectors of the radio-electronic industry that are the most competitive today. It is a specialized and professional branch of radio-electronics. At the same time, it should be noted that attention should be paid not only to increasing the volume of final products, but also to building the entire production chain.

## 7. Conclusion

There is no doubt that the radio-electronic production of our country has secured the status of a strategic industry, which is the basis for the production of absolutely all equipment. Only joint efforts of the state in the sphere of business will contribute to the fact that our country will reach a higher competitive level and become completely independent from foreign suppliers.

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