

## AERIALS SAFE-FOREST SYSTEM

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Millions of hectares of forest have been destroyed by fires in recent years.

So, for example, in Australia, since December 2019, 24 people have died from fires, 6 are on the list of missing persons. Estimates of the dead animals vary from 400 million to 1.25 billion individuals and this is only mammals, birds and reptiles, that is, not counting amphibians, insects and other invertebrates. Also, about 200 residential buildings were burned down. Thousands of people were forced to flee their homes. Since the beginning of the fires, according to experts, the fire has burned out territories over 20 million hectares. Forest fires in Siberia in 2019 began at the end of June and the fire centre exceeded 2.5 million hectares (this is comparable to the territory of Crimea or Belgium), and the smoke "reached" the Volga region, Alaska and Canada. The smoke contains carcinogenic agents and this leads to the development of cardiovascular disease, asthma and other serious health problems. Fauna also suffers: as a result of fires in Siberia, thousands of animals, including young ones, have died, which directly affected the decline in their populations. As a result of fires in California, 680 thousand hectares of forest burned down. Tens of thousands of people were

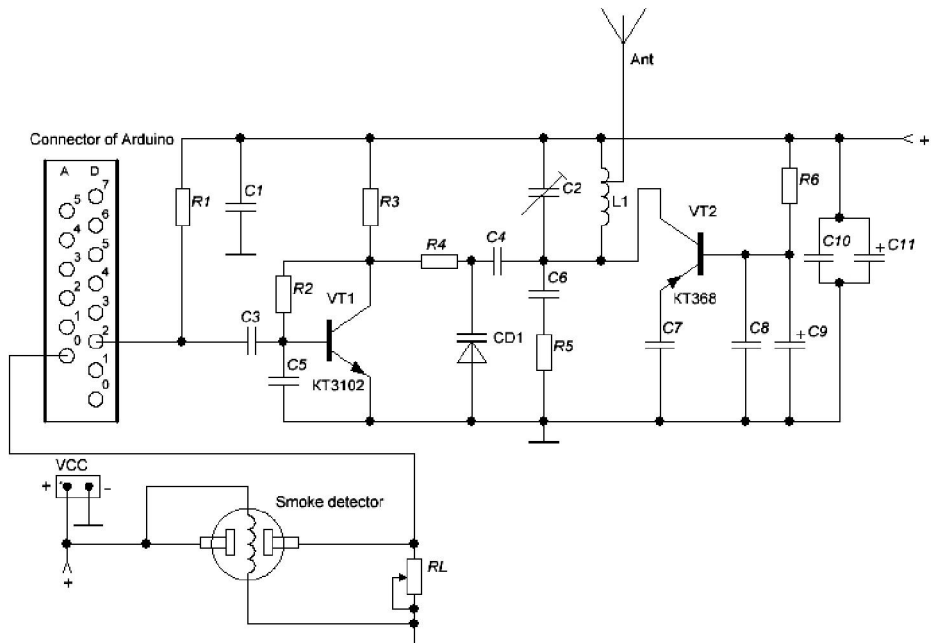


Figure 1. Electrical schematic diagram of the ground device

evacuated. More than 10 people died.

Many scientists in the world are dealing with this problem. Various fire extinguishing systems have been proposed [1-3].

Our device, «the Safe-Forest System», offers an early warning method for forest fires. It is compact, easy to manufacture, cheap and energy-efficient.

The device consists of commonly used radio-technical elements enclosed in a waterproof case. Our development does not need protection from high temperatures, because, in the event of a fire, it will in any case be fatally damaged. It is proposed to use an Arduino controller as a control microprocessor, as it has proven itself in terms of price-quality ratio.

The principle of its work is as follows. Smoke detectors are deployed throughout the forest. One or more (depending on the size of the area covered by the sensors) drones fly over the forest according to the program in automatic mode, which requests information from the sensor from each device and transmit it to the fire services.

The layout of the ground device is shown in Figure 1. The block diagram of the operation algorithm of the ground device is shown in Figure 2.

The developed device is characterized by unlimited possibilities for improving both software and hardware parts. Currently, an active search for an investor is underway, with the help of which it will be possible to begin the practical implementation of this system.

#### References:

1. Kong Hasung and oth. Fire alarm systems technology. Daegu: Yesami Midio, 2020. P. 3–20.
2. Song Yong Seal, Lee Yong Il, Lee Sang Hyun. Research on improving the reliability of automatic fire detection systems // Collection of articles of the Korean Scientific Society of Fire Fighting. T. 22. No 4. 2018. 43 p.
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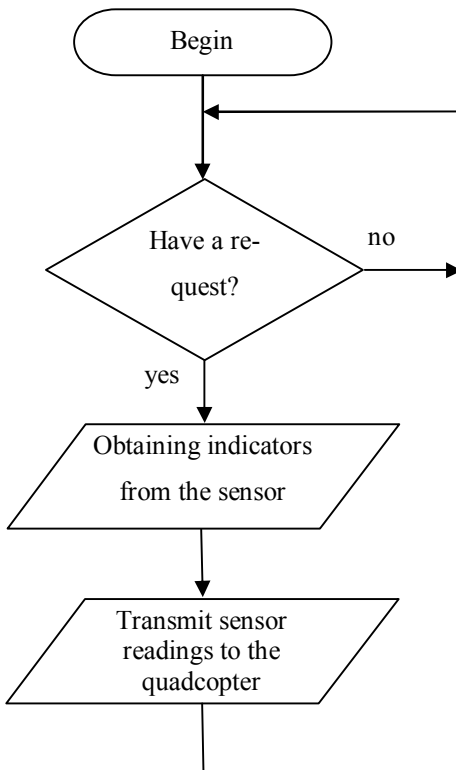


Figure 2. Algorithm of the device