

Design and Development of Electronic Security System for Agricultural Field

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Abstract

Now a days security of agricultural field is very important. Threats to agricultural field can come from many sources. Intentional destruction or contamination of crops is a possibility that producers must guard against. Safe substances may be used to produce unsafe or harmful combinations if used incorrectly or indiscriminately. These include chemicals, and physical damage. Farmer has to safeguard the field against all such acts willful destruction. A system has been designed for protecting the crop in the field. The developed system will help in detecting an intrusion in the crop field and in many cases thwart it too. It is a fencing system which not only detects when rouge animals have entered the field but it drives them out too.

Keyword: Agricultural field, Security, controlled gate access, motion detectors

1. INTRODUCTION

Food is the most important requirement for living beings. The main products of our food come directly or indirectly from agriculture. But as with other valuable assets, agricultural fields also require security. Ensuring the physical security of

the field is an important step in overall security of the crop and its produce. A conscious effort should be taken to assess and control security risks by recognizing and anticipating security issues before they surface.

- Using security lighting, perimeter fencing, and controlled gate access.
- One way of securing the field is fencing the perimeter using barbed wire. This wire should be looped around the field many times around so there is no possibility of any person or animal entering from anywhere.
- Using electronic security devices, such as motion detectors, and alarms linked to an off-site security system.

There is a need of security in the crop field and in the storage bin, both needs to be secured in order to safeguard the final yield of the crop. Crop is threatened by intruders both man and animal. It may even be destroyed by pests like rabbits and mice. The threat to the crop from some agents can be eliminated or minimized by using certain security systems. There are plenty of circuits that can be used to prevent such damage. One such system is a high voltage fence. In this circuit the perimeter of the field is protected by a high voltage fence which can give mild shocks to animals or people trying to enter the field. But it is not safe for small children and pets. The other circuit sounds an alarm when it encounters an intrusion.

2. CIRCUIT DESCRIPTION OF THE SYSTEM

Circuit diagram is shown in Figure 1. The working of the circuit ^[4] is described below. The security system installed in the field is called a broken wire alarm system. Some sort of barbed wire to keep animal away usually surrounds the crop field. But most of the time animals are able to find ways inside the field and destroy the crop. The only way to prevent the crop damage is to manually monitor the field at all times and drive away the animals. But it might not be possible all the time our system does this automatically.

In this system we need to surround the field by using a thin copper wire which is electrically conducting. This wire can be used as a sensor to detect intrusion. As soon as some animal or human enters the field by breaking this wire a loud alarm is sounded. The alarm sounding speakers / buzzers are kept in the center of the field protruding outward. The alarm sounded is very harsh and loud, this can drive the animals out of the field thus protecting the field. The circuit can be battery powered as it consumes very little power when it is not active.

3. WORKING

The circuit below sounds the alarm if the wire surrounding the field is broken somehow. If the animals enter the field breaking this wire the circuit sounds a loud alarm in a harsh tone which may compel the animal to run out of the field and at the same time alerting the farmer about the intrusion. The circuit works as follows. As long as the fence is not breached i.e., the wire is not broken the transistor ^[1,2,3,5] does not conduct. However, as soon as the wire is broken the transistor switched on and it sounds the alarm. The buzzer is a high power shrieking kind that sounds very harsh to animals. It is placed in such a way that it

drives the animals out of the field. There are plenty of loud buzzers available these days which emit a special frequency which is unpleasant to animals and small pests. More than one buzzer can also be used to drive away most of the intruders from the field. This device is very much useful for protection the field from animals.

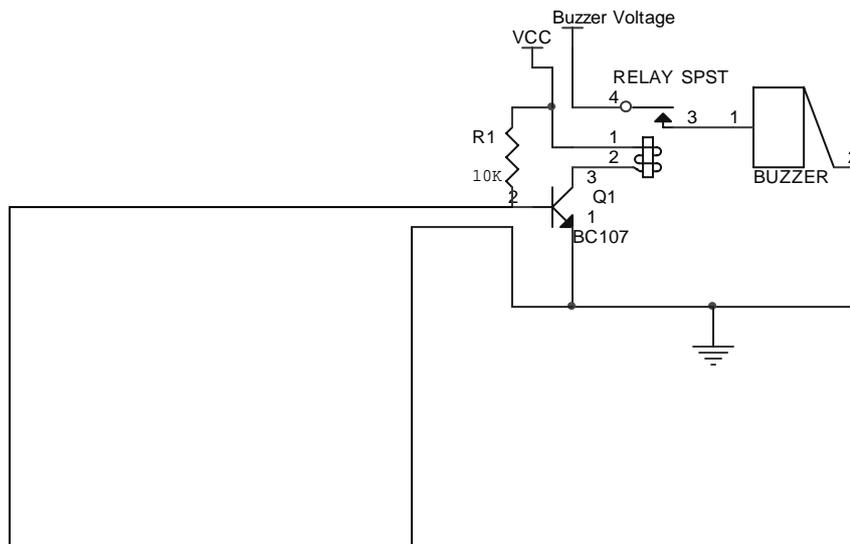
4. CONCLUSION

This is a fence alarm system which can help to save the crop from pests and other animals when it is in the field. The system can detect any intrusion in the field and sound the alarm. By proper placement of harsh sounding buzzers the animal can be driven out of the field.

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Field surrounded by the sensor wire

Figure 1. Circuit diagram of broken wire fence alarm system