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Solar-Powered Bird Scarer

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Abstract: *Presented here is a solution scare off birds from your farm house, fruit garden or warehouses. Usually birds dislike a sound around 200HZ and will avoid that environment. Circuit take advantages of this fact and generate sound vibrations at a 211.5HZ. It is fully powered by a solar panel and there is no need of battery or AC source. So total renewable energy source is required and its beneficial for farmers also*.
Key Words: *Bird Scarer, Solar.*

I. Introduction

A **bird scarer** is any of a number device designed to scare birds, usually employed by farmers to dissuade birds from eating recently planted arable crops. They are also used on airfields to prevent birds accumulating near runways and causing a potential hazard to aircraft.

Nothing can be more irritating than having to constantly chase birds from your farm or field. This makes the solar powered bird scarer, a device which uses natural bird distress calls or sounds to drive them away, a must have especially for grain farmers. However, these are not the only end users of bird scarers. Airports and urban areas also deploy bird scarers to keep away birds, which can not only be a source of noise pollution and aggressive behavior, but can also leave their droppings all over, prompting huge cleaning costs. In a solar farm, huge amounts of birds can result into unwanted shades thereby reducing the amount of solar power harnessed. To put this into perspective, Volkswagen incurred heavy costs to install a bird scaring mechanism, in their transparent glass manufacturing plant in Dresden, which uses loudspeakers to mark the territory as 'taken'. Bird scarers are very important since they help in tackling the problem on unwanted birds and substitute the methods that were used before which were either very labour intensive as is the case when people have to guard the fields to manually chase away the birds or methods which with time become inefficient or no longer fool proof as is the case of scare crows. After a while, the birds discover that the scare crows are harmless.

II. Objectives

The primary objective of this mini project can be summarized as follows:

- The bird scarer is portable and can be placed anywhere.
- It is found effective within a radius of 2-3 meter.
- The frequency generated is 211.5Hz
- This implies that for effective control, the bird scarer should be modelled based on these sounds, by buzzer.
- The step is then integrating a solar panel and using it to power the system.

III. Literature Survey

The research paper and literatures collected on the various topics is listed below.

a. Electronic for you magazine November 2013
b. Koyuncu, T., & Lule, F. (2009).
c. Suryawanshi, V. R.(2013)
d. © NXP B.V.(Founded by Philips)
e. Timothy Lewis Clarke(2004)

Summary of literature review:

I. D. Mohankumar "Electronic For You (November 2013)"
The article in this edition is published by D. Mohankumar. Vol:45 no. 11. This paper presents total circuit diagram and objectives and advantages of solar powered bird sacrer. And also gives the test results and its range and uses. In this paper 7555 IC is used to get the desired output, and Piezo Buzzer is used. The total circuit is powered by solar panel i.e. 6V 300mA.

II. Koyuncu, T., & Lule, F. (2009). "Design, Manufacture and Test of a Solar Powered Audible Bird Scarer"

This paper presents the brief idea of solar powered bird scarer. This paper is published in Turkey and gives total idea and also provides four main observations. Total 18 sounds are used in this experiment as it is connected to mp3 player, but in our paper we are going to use buzzer (PZ1). Hence we will have the output of 211.5Hz as it stresses the birds to fly away from or place of installed project.

III. Suryawanshi, V. R.(2013) "Design, Manufacture and Test of a Solar Powered Audible Bird Scarer and Study of Sound Ranges Used in it."
In this paper we get brief idea of mp3 player based solar powered bird sacrer. It has total 22 sound waves in which only 7 are most effective on field the main objective of this paper was to develop scary sound in different frequency it is not totally free, as battery supply is used and if used continual the battery may get discharge in 1 week

IV. © NXP B.V.(Founded by Philips) "ICM7555 General purpose CMOS timer"
In this paper we got detail idea of IC7555, also its features, characteristic's, datasheet, limed values, application information etc.

V. Timothy Lewis Clarke "An Autonomous Bird Deterrent System"
This paper gives total bird scarer information and its applications, and also shows the different types of bird scarer such as ultrasonic, sonar, eco-friendly, hybrid system, chemical system, etc. Course ENG4111 and 4112 Research Project Submitted: October, 2004

IV. Research Methodology

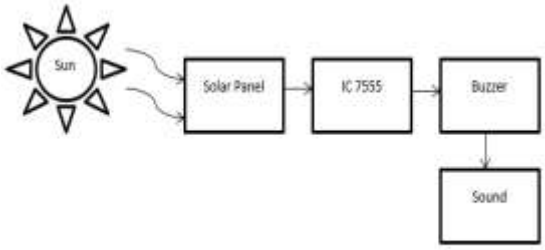

Fig: Block diagram

The above block diagram shows the flow of circuit and components arranged in the above given manner

1. **Solar panel:** It absorbs sunlight as a source of energy to generate electricity. Hence the output of this solar panel is 6V, 300mA.
2. **IC7555:** The IC 7555 is a stable controller capable of producing accurate time delays or frequency. Therefore the IC do desired function and gives the pulse with modulation.
3. **Buzzer:**Piezoelectric buzzers, or piezo buzzers, as they are sometimes called, were invented by Japanese manufacturers and fitted into a wide array of products during the 1970s to 1980s.The output is 211.5Hz which will fly away the birds

V. Planning of Work

This system consists of renewable energy, such as PV panels. The proposed work is planned to be carried out in the following manner.

- Study of Damage done by birds on crop fields
- Preparation of Solar Powered Bird Sacrer
- Analysis the system effectivity
- Design the model for system
- Preparation for comparative statement

VI. Facilities required for proposed work:

1. Software: NI MULTISIM V14.0
2. Part list:

Semiconductors:	
IC1	-7555 timer
D1	1-N4007 rectified diode
Resistors (all ¼- watt, ±5% carbon):	
R1	-68 kilo-ohm
R2	-100 ohm

Capacitor:	
C1	-470µF,25V electrolytic
C2	-0.1µF ceramic disk
C3	-0.01µF ceramic disk
Miscellaneous:	
SP1	-2-pin mating connector -6V, 300mA solar panel
PZ1	-Piezo-buzzer
S1	-On/off switch

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