"ELECTRONIC BIRD REPELLER"

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ABSRACT

All around the world, domestic birds are a major threat in the field of agriculture causing damage to economic field crops, storage houses etc.so therefore their is a need for effective bird repeller, the most common pest birds in many countries are crows, myna ,jungle myna, white cheeked, bulbul, acridotterestrictis etc. In order to distract these birds away their are many traditional methods such as scare crow models, hawk kites, coloured lights, lasers etc are used. In nowadays its not seem very effective bird deterrent technique. "solar powered audible bird scarer (SPAB)" is a very effective bird repeller has been developed. By using different sounds the different birds are deterrent.

KEYWORDS:*SPAB, Relay, RTC, LCD(I2C), DSP1307,* Ardiuno ATMEGA328P.

1. INTRODUCTION

Birds are one example of pests for farmers. Birds will attack when the rice starts to contain. This bird attack is very detrimental to farmers because the birds attacked in colonies or groups in large numbers. Some attempts by farmers to expel the pest by making scarecrows and others, but less effective. An alternative that can be used to repel birds is by using waves. Birds have an extraordinary sensitivity to sound. They have evolved with superior hearing ability to adapt to the higher levels of performance necessary to communicate, hunt, and navigate while in flight. Birds hearing requirements include excellent absolute hearing sensitivity, frequency perception and time perception. Bird hearing is about 29 kHz. To answer that problem, we designed an electronics device for detecting and repelling pests using sensors. The role of sensor-based tool is expected to help the community in reducing pests in the field of agriculture. The design of this prototype aims to make pest repellent using microcontroller with SPAB. The waves generated by this prototype are automatically arranged by the author for the bird. The prototype is connected to a system that functions as information if birds are detected. Microcontroller used for this research is ArduinoUno. This prototype is designed simple and practical, to be used by any circle.

These birds not only give damage to the agricultural area but also make dirty the human life area. Besides birds are known to carry over 60 transmissible diseases some potentially fatal. Bird droppings help to spread disease when fecal dust enters living areas or when someone enters contaminated spaces and starts breathing in fungal spores.

Serious diseases associated with pest birds include:-

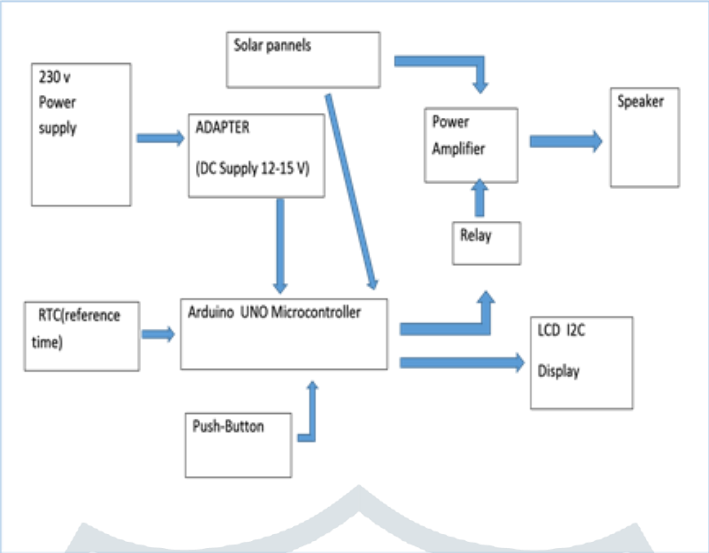
- Histoplasmosis
- Salmonellosis
- Candidiasis
- St. Louis Encephalitis..ETC.

In order to protect these areas against bird damage, some studies about mechanical and chemical fighting methods have been made up to now. For instance, it was reported in the literatures that the effect of 50% anthraquinone and 75% methiocarb, caffeine, garlic extract, physical barriers such as net or acrylic fibres, distress calls of birds, human bird scarer and colored lights on birds were studied. From the results of these works, it can be said that the most effective method is the physical barriers such as nets and fibers for agricultural areas. However, the use of properly mounted and maintained nets is quite expensive. Besides, there is also not enough studies are reported in the literatures for protecting the city streets against bird's dirtiness. When social birds are dispersed using other bird scaring methods such as loud noises they generally do not fly far away. They would normally just settle on the nearest safe perch, which might be quite close to the area where they are causing a problem. With the use of distress call bird scares, they generally tend movefurther away from the call source and the entire uncomfortable area.

2.METHODOLAOGY

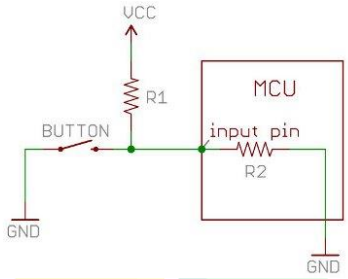
Every electric and electronic device that are used in our day to day life we require power supply. In general we use an AC supply of 230 volts, 50HZ, but this power has to be changed in to the required form with required value or voltage range for providing power to controller i.e arduino that is in range of 9v to 12v dc must be rated for a minimum of 250mA current output.

Block-Diagram



2.1.1 REAL TIME CLOCK

real time clock(RTC) is used to keep track of the current time clocked by 32.768KHZ crystal even though when the main power supply is lost, because it consumed less than 500nA on 3 volts backup lithium battery 48mA/hr or greater, the DSP1307 will continue to operate more than 10 years in the absence of the main power supply. The DSP1307 is capable to count accurately the second, minute ,hour, day of the week, month, year, including leap year with its features. I2C



interface capabilities make this chip easily to be integrated with widely available microcontroller.

2.1.2 PUSH BUTTON

The value of the pull-up resistor needs to be chosen to satisfy two conditions: When the button is pressed, the input pin is pulled low. The value of resistor R1 controls how much current you want to flow from VCC, through the button, and then to ground. When the button is not pressed, the input pin is pulled high. The value of the pull-up resistor controls the voltage on the input pin. With a pull-up resistor, the input pin will read a high state when the button is not pressed. In other words, a small amount of current is flowing between VCC and the input pin (not to ground), thus the input pin reads close to VCC. When the button is pressed, it connects the input pin directly to ground. The current flows through the resistor to ground, thus the input pin reads a low state. if the resistor wasn't there, button would connect VCC to
ground, which is very bad and is also known as a short. A low resistor value is called a strong pull-up (more current flows), a high resistor value is called a weak pull-up (less current flows).USB has high value pull-up resistor can limit the speed at which the pin can reliably change state. This is why you will often see 1k to 4.7KΩ resistors on USB signal lines

2.1.3 LCD (I2C)

The I2C 1602 LCD module is a 2 line by 16 character display interfaced to an I2C daughter board. The I2C interface only requires 2 data connections, +5 VDC and GND to operate.

Specifications:

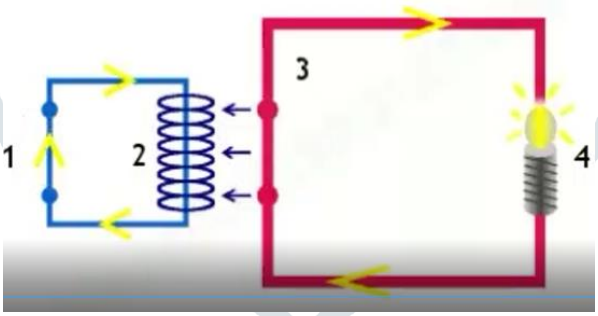
I2C adress range	2 lines by 16 character 0*20 to 0*27
Operating voltage	5V DC
Backlight	White
Contrast	Adjustable by potentiometer on 12c interface
Size	80mm*36mm*20mm
Viewable area	66*16mm

2.1.4 ARDUINO ATMEGA328P

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without working too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again. Arduino is an open source microcontroller which can be easily programmed, erased and reprogrammed at any instant of time. Arduino uses a hardware known as the "Arduino development board" and software for developing the code known as the "Arduino IDE" (Integrated Development Environment) Built up with the 8-bit Atmel AVR microcontroller's that are manufactured by Atmel or a 32-bit Atmel ARM, these microcontrollers can be programmed easily using the C or C++ language in the Arduino IDE. Arduino has endless applications as it has been used extensively for creating projects by hobbyist, amateurs and professional in various fields of engineering. Their are so many of amazing projects that have been developed on an Arduino platform.

2.1.5 RELAY

A relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current. The heart of a relay is an electromagnet(a coil of wire that becomes a temporary magnet when electricity flows through it.



- The input circuit(blue loop) is switched off and on current flows through it until sometime (either a sensor or a switch closing) turns it on. the output circuit(red loop) is also switched off.
- When a small current flows in the input circuit ,it activates the electromagnet(shown here as a dark blue coil),which produces a magnetic field all around it.
- The energized electromagnetic pulls the metal bar in the output circuit wards it, closing the switch and allowing the much bigger current to flow through the output circuit.
- The output circuit operates a high current appliances such as alarm or an electric motor.

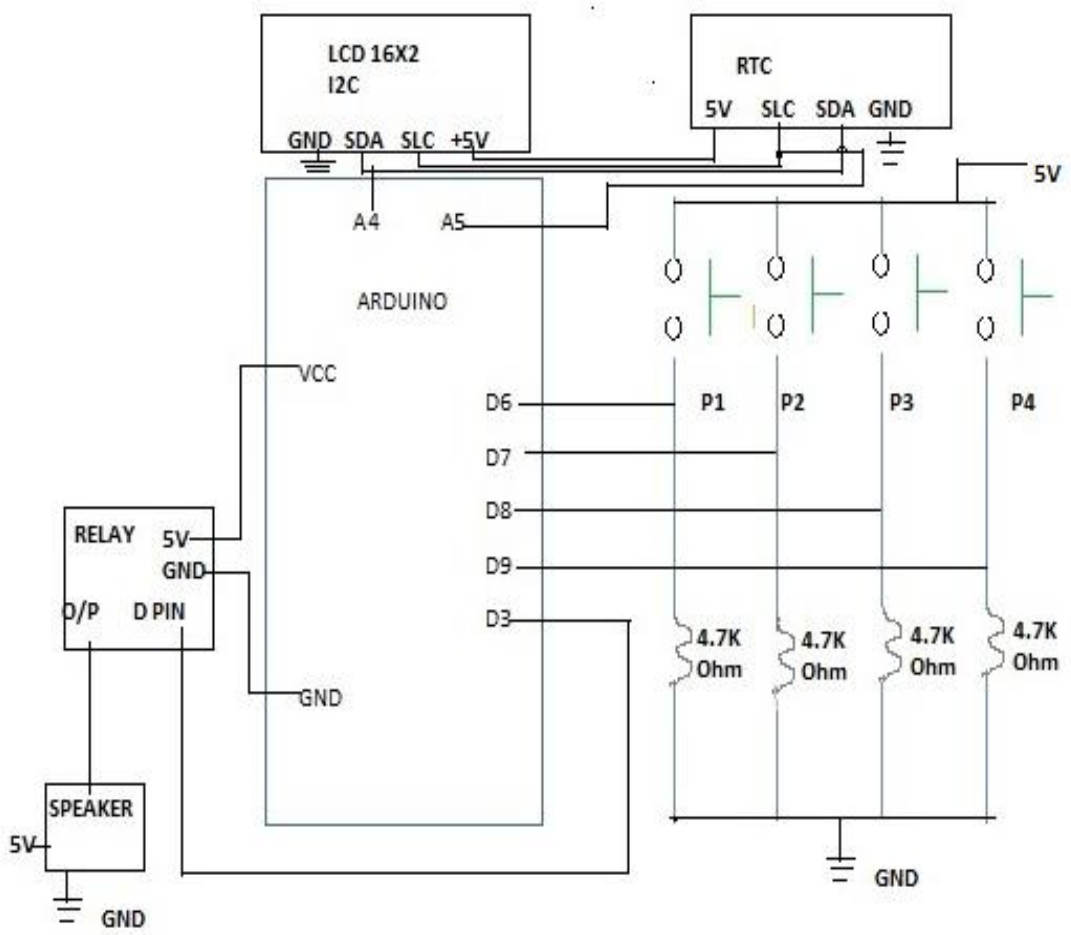
3.IMPLEMENTATION

Bird deterrent device that transmit sound of a biological relevance recorded bird alarm during Morning and evening respectively. such that birds are presence near field will get distress because of highly intensified speaker and vocalized at that a time set such that produce irritation to birds therefore this method sounds as a electronic audio repellents or resistance to bird species

All concern the use of bird scaring at agriculture, an area where effective bird scaring is essential and many techniques have been assessed in order to reduce the risk of bird strikes. Transport canada's control

produces manual (1994)states that the effectiveness of ant technique varies with bird species and that habitation will eventually occur with any scaring technique that is not reinforced by the demonstration of actual danger. Constantly changing the appearance and location of the device should help to prevent rapid habituation. An effective bird control programming should involve the use of several technique used in a random extensively used to disperse birds on air field and can be effective as long as the sound source is frequently moved.

3.1 CIRCUIT DIAGRAM



In the above circuit the power to the device is given by either solar panel or 230v power supply through adapter (Dc power supply 12-15v) and controlled by +5v given by reference clock. The push button is used to
set the alarm that is series interface is done by LCD(I2C) and electromagnetic relay. Now whenever requires and that is given to power amplifier to boosts the signal and finally to speakers.

4.TESTING AND RESULTS

The output of speakers is 17kHZ-18.5Khz some of the frequency of species are listed below.

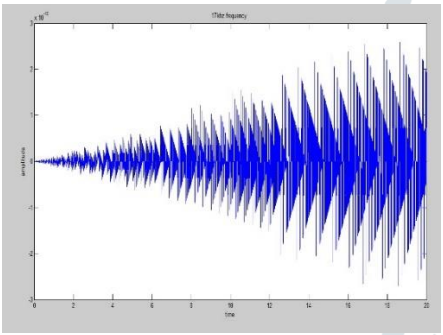
4.1 SOME RECEPTION RANGE OF VAROUS BIRDS

Species	Frequency(HZ)
House sparrow	675-11500HZ

Pigeon	50-12000HZ
Eagle owl	60-8000HZ
Cape penguin	100-15000HZ
American crow	300-800HZ

The basic idea behind the system is to generate the sound signal which will be in audible to birds and irritating for the species, there irritating frequency can be estimated by specific logic and can be selected and adjusted by trial and user methodology. Irritating frequency generates of a specific loudness is designed in addition with some intelligent operation to sense the traffic of animals/vehicle.

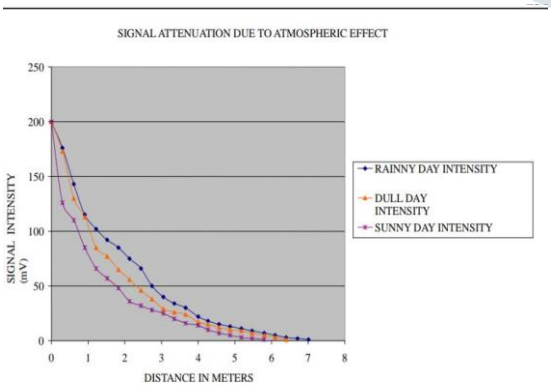
4.2GRAPHICAL REPRESEN TATION



Birds have an extra ordinary sensitivity to sound. Optimum hearing performance for most birds species is achieved between 1000-400HZ ,bats which can hear about more than ultrasonic range which are not deterrent from the field pigeon have expectation low frequency , frequencies as low as 0.05HZhave been discerned by pigeons in a sound isolated chamber. varied as shown classically conditional heart rate changes were used as behavioral we are used of sensitivity so only to avoid danger to pigeons , the intensity is in mat lab.

Selected areas with high levels of bird activity based one area and observed it until feeding level of a sampling interval was chosen observation were randomly intern accomplished during day light hours that is shown in above of mat lab sound output pitch.

For the efficient purpose the multidirectional deterrent amplitude repellent are used.The above figure depicts the sound of 17KHZ in MATLAB simulation.



Signal Attenuation Due To Atmospheric Effect: It was noted that the high frequency sound waves produced by the speakers attenuated in intensity with increasing distance from the sound source at a specific rate as shown in figure .This was true for sunny, rainy and dull days. It can be observed in figure that the ultrasound generated by the device traveled slightly farther in moist air (7.0m reach) than in dry air (less than 6m reach). This is primarily due to the lower concentration of Carbon (IV) Oxide (CO2) in moist air due to its solubility in water and of dust particulate matter in moist air. These and the higher concentration of water vapour means a lower air density. Conversely, on sunny days, the dry air is of comparatively higher density and contains entrained dust particles; such air will therefore vibrate less readily. Sound travels more slowly through such a medium. This explains why the

attenuation was less on a rainy day than on a sunny day. This phenomenon is an advantage since the device will be very useful to farmers especially during the rainy season; when fruits of rain-fed cereal crops develop and granivorous birds' nuisance pervade

5.CONCLUSION

Birds cannot be physically stressed by an unless can focus a frequency approaching to a birds , i.e deliver a sound intensity of over 140db at the location of the birds ear. The physical effect can be minimized by the intensity and focusing required to cause such effects.

In this paper, we have introduced the concept of a bird repeller system such as a device and its design which applies a stimulus to the wild birds as a control function. We have considered the effect of sound stimuli on the birds but have had questions due to habituation. And we have considered the option of several types of sounds and playing methods.

Our future work has a number of different directions and different locations. We will work on image processing to detect birds and animals and we will conduct several physical experiments. We also wish to create new algorithms using machine learning to make effective repeller system which will lead to new and improved models. These models will lead to a better understanding of wild animals and control at the individual and group level.

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